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ABSTRACT

The National Household Education Survey (NHES) was conducted for the first time in 1991 as a way to collect data on the early childhood education experiences of young children and participation in adult education. Because the NHES methodology is relatively new, field tests were necessary. A large field test of approximately 15,000 households was conducted during the fall of 1989 to examine several methodological issues. This report describes the design of the field test and the outcomes of its collection activities. Unit and item response rates and the burden associated with survey participation are described. The telephone methodology of the NHES survey offers some important advantages for the program; it is less expensive than a comparable personal interview survey, and it can also be instituted relatively quickly, address several subject matter areas at the same time, and provide results in a very timely fashion. The NHES offers the potential for examining education issues that have been difficult to address through the more traditional National Center for Education Statistics surveys that are based on institutional samples. The field test has shown that many of the concerns can be handled adequately. Fifteen tables and six figures illustrate the overview. (SLD)

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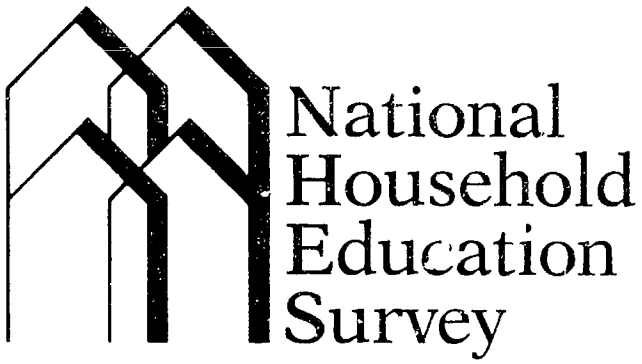
Technical Report July 1992

National Household Education Survey

Technical Report No. 1

Overview of the NHES Field Test



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"The purpose of the Center shall be to collect, and analyze, and disseminate statistics and other data related to education in the United States and in other nations."—Section 406(b) of the General Education Provisions Act, as amended (20 U.S.C. 1221e–1).

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Foreword

The National Household Education Survey (NHES) represents a major new initiative of the National Center for Education Statistics (NCES). Between February and May of 1991, the NHES was fielded for the first time as a mechanism for collecting data on two different sectors of education policy interest: the early childhood education experience of young children and participation in adult education. Because the NHES methodology is relatively new and relies on some innovative approaches, a field test of the methodology was an essential first step in the development of the survey. Many of the methods of evaluated during the 1989 NHES field test were adopted for the full-scale survey.

A large field test of approximately 15,000 households was conducted during the fall of 1989. A number of methodological issues associated with collecting and analyzing data on education issues from a random digit dialing telephone survey were examined. This report is one of five that describe the 1989 NHES Field Test experience. The five reports are the first in a series of technical publications pertaining to the design and conduct of the NHES that NCES hopes to continue in the years to come. NCES believes that the reports contained in this series will provide users of the NHES data with a better understanding of the NHES methodology and that they will assist the survey design efforts of others.

The first report in this series, *Overview of the National Household Education Survey Field Test*, describes the design of the field test and the outcomes of the field test data collection activities. It reports on the response rates obtained, both unit and item, and the burden associated with survey participation. Each of the next four reports in the series focuses on a specific issue that was examined in the 1989 NHES field test.

The second report, *Telephone Undercoverage Bias of 14- to 21-Year-Olds and 3- to 5-Year-Olds*, analyzes data from the Current Population Survey to identify the extent of telephone coverage for two distinct populations of interest and the bias associated with this type of undercoverage for estimates of school dropouts and early childhood education program participation. Methods for adjusting survey estimates to partially reduce this bias are developed and evaluated.

The third report, *Multiplicity Sampling for Dropouts in the NHES Field Test*, examines a technique that was used to increase the coverage of 14- to 21-year-olds and to capture more dropouts in the sample. The report describes the effectiveness of the multiplicity sample in achieving these goals.

The fourth report, *Proxy Reporting of Dropout Status in the NHES Field Test*, focuses on measurement errors arising from the use of proxy respondents. During the 1989 Field Test, a knowledgeable household member was used as a source of information on the school enrollment of each sampled 14- to 21-year-old in the household. In addition, 14- to 21-year-olds were asked to report on their own school enrollment. The report describes the correspondence between the responses given by proxy respondents with those provided by the youths themselves.

The fifth report, *Effectiveness of Oversampling Blacks and Hispanics in the NHES Field Test*, describes the approach used to increase the number of black and Hispanic households/youth in the sample. During the field test, an approach that uses demographic information at the telephone exchange level to develop sampling strata was used to oversample black and Hispanic households. The report examines the yield of the field test sample design versus that which would have been expected without oversampling. The effects of oversampling on the precision of survey estimates are reported.

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Acknowledgments

Many individuals made significant contributions to the 1989 National Household Education Survey (NHES) Field Test and to the preparation of this report. The authors gratefully acknowledge their efforts. The 1989 Field Test was conducted by Westat Incorporated under contract with the U.S. Department of Education, National Center for Education Statistics (NCES). Lance N. Hodes was the corporate officer at Westat with oversight responsibility for the NHES Field Test. Jacque Wernimont and David R. Martin, both Westat senior systems analysts, played major roles during the design and implementation of the survey and creating the database used in the analyses found in this report.

Critical technical review of this report was provided by NCES staff Michael Cohen, Bob Burton, Marilyn McMillen, and Jeffrey A. Owings, Branch Chief, Longitudinal and Household Studies Branch. Sandra Hofferth of the Urban Institute reviewed the report. The authors wish to thank each of these individuals for their careful reading of this report and for their comments and suggestions.

Table of Contents

List of Tables

List of Tables (continued)

List of Figures

Introduction

The National Household Education Survey (NHES) is the first major attempt by the National Center for Education Statistics (NCES) to go beyond its traditional, school-based data collection systems to a household survey. A household survey has the potential of providing the types of data needed to address many current issues in education. Included among issues that can be assessed through surveys of persons in their households are dropping out of school, preschool education, access to postsecondary, adult and continuing education, the status of former teachers, extra-school learning, and home-based education.

NCES has a legislative mandate to collect and report information on the condition of education in the United States. To fulfill this mandate, NCES historically has sampled educational institutions to collect data about teachers, students, schools, school districts, and state education agencies. The collection of data from noninstitutional samples of individuals, particularly through household-based surveys, has been limited. The NHES represents a new initiative for NCES, and holds the promise of greatly enhancing the scope of the issues covered by the data collection activities of the Center.

The NHES is a mechanism for collecting detailed information on educational issues from a relatively large and targeted sample of households in a timely fashion. It fills a need that existing household surveys, such as the Current Population Survey (CPS) and the Survey of Income and Program Participation (SIPP), cannot satisfy because they are designed to focus on issues other than education. Consequently, when these existing surveys are used to collect data on topical educational issues, it must be done in a limited and supplementary manner. The level of detail in such supplements is limited because the respondent is already burdened by the basic (or core) survey data items. In addition, researchers who use a supplement to an existing survey to collect data on other issues lack the ability to target the sample to particular population groups because the sample designs were established to meet other objectives.

The NHES Field Test was targeted to the groups of interest by screening and sampling devices. The instruments were designed to address the selected issues in detail so that analyses could be performed to help illuminate the phenomena of interest. Furthermore, the data collection methodology was specifically designed so that relatively complex issues, such as the preschool arrangements of children, could be handled smoothly and efficiently.

This report provides an overview of the design and procedures for the NHES Field Test, which was conducted in the Fall of 1989. In addition, this report provides a detailed analysis of survey response rates, for both the instruments and individual items, and an analysis of the administration times of the various Field Test instruments.

Survey Topics

NCES has as its legislative mission the collection and publication of data on the condition of education in the Nation. The National Household Education Survey is specifically designed to support this mission by providing a means to address educational issues that cannot be adequately studied through the Center's traditional, institution-based data collection efforts.

As a first step in realizing the potential of NHES, two topics of broad policy interest were selected for the Field Test. One topic concerned dropouts. The 1988 Amendments to the School Improvement Act (P.L. 100-297, Sec. 406) require NCES to:

- (g)(4)(A) ". . .conduct an annual survey of dropout and retention rates as an education indicator. . .".

In response to this mandate, NCES is in the process of developing a dropout statistics program. It is examining the feasibility of several different approaches to collecting annual data on dropouts. The NHES is one possible component of this program.

The second topic covered by the Field Test was the early childhood educational experience of 3- to 5-year-old children. As more women enter the labor force and as children are exposed to a greater variety of out-of-home experiences prior to first grade, educators, policymakers, and researchers have become increasingly interested in the early educational experiences of preschool children. The national education goal pertaining to school readiness has focused even more attention on early life experiences and the role they play in preparing children for

successful school experiences. However, limited information is available at the national level that may be used to monitor these experiences.

The early educational experiences of young children cannot be fully addressed through facility-based studies because so many preschool-aged children are cared for only in their own or other private homes. In addition, there is no comprehensive list of all child care facilities and preschools in the United States from which a sample can be drawn, and many places providing child care are not formally licensed or identified on official lists. The data collected in the NHES Field Test sample can be used to help direct NCES projects aimed at improving the information base on younger children, and may provide information that will be useful for the design of future longitudinal surveys of preschool children.

Study Components

The National Household Education Survey Field Test consisted of two general components. The first was the telephone survey component, which addressed school dropouts and early childhood education. The second was a school-based approach designed to test an alternate methodology for estimating dropout rates.[1] This report focuses on the telephone survey component. In general, when this report refers to the "NHES," it is discussing the telephone survey component of the Field Test, unless the school-based component is specifically mentioned.

Field Test Telephone Survey

The NHES methodology is relatively new, and some of the approaches are innovative. For this reason, a Field Test of the methodology was an essential first step in the development of an approach for an ongoing household telephone survey effort. In particular, the Field Test addressed the methodological issues associated with collecting and analyzing data on educational issues from a telephone survey.

The Field Test can be viewed as a small-scale NHES in which a smaller number of households were sampled than would be included in the full-scale survey. Other than the size of the sample, and the consequent reduction in analytic capability, the Field Test was intended to use all of the features of the full-scale NHES surveys, including the use of random-digit-dialing (RDD) and computer assisted telephone interviewing (CATI) methods.

Four interviews were conducted during the Field Test in order to address the two survey topics of interest:

- A **Screener Interview**, which was used to enumerate household members, determine eligibility to proceed with other interviews, and collect basic household characteristics,
- A **Household Respondent Interview (HRI)**, which collected information on the educational status of 14- to 21-year-olds from a knowledgeable adult household member;
- A **Youth Interview**, which collected data on educational status, experiences, and expectations from sampled 14- to 21-year-old youth; and
- A **Parent/Guardian Interview**, which collected information on the child care and preschool arrangements for 3- to 5-year-olds, as well as information on the educational environment in the home.

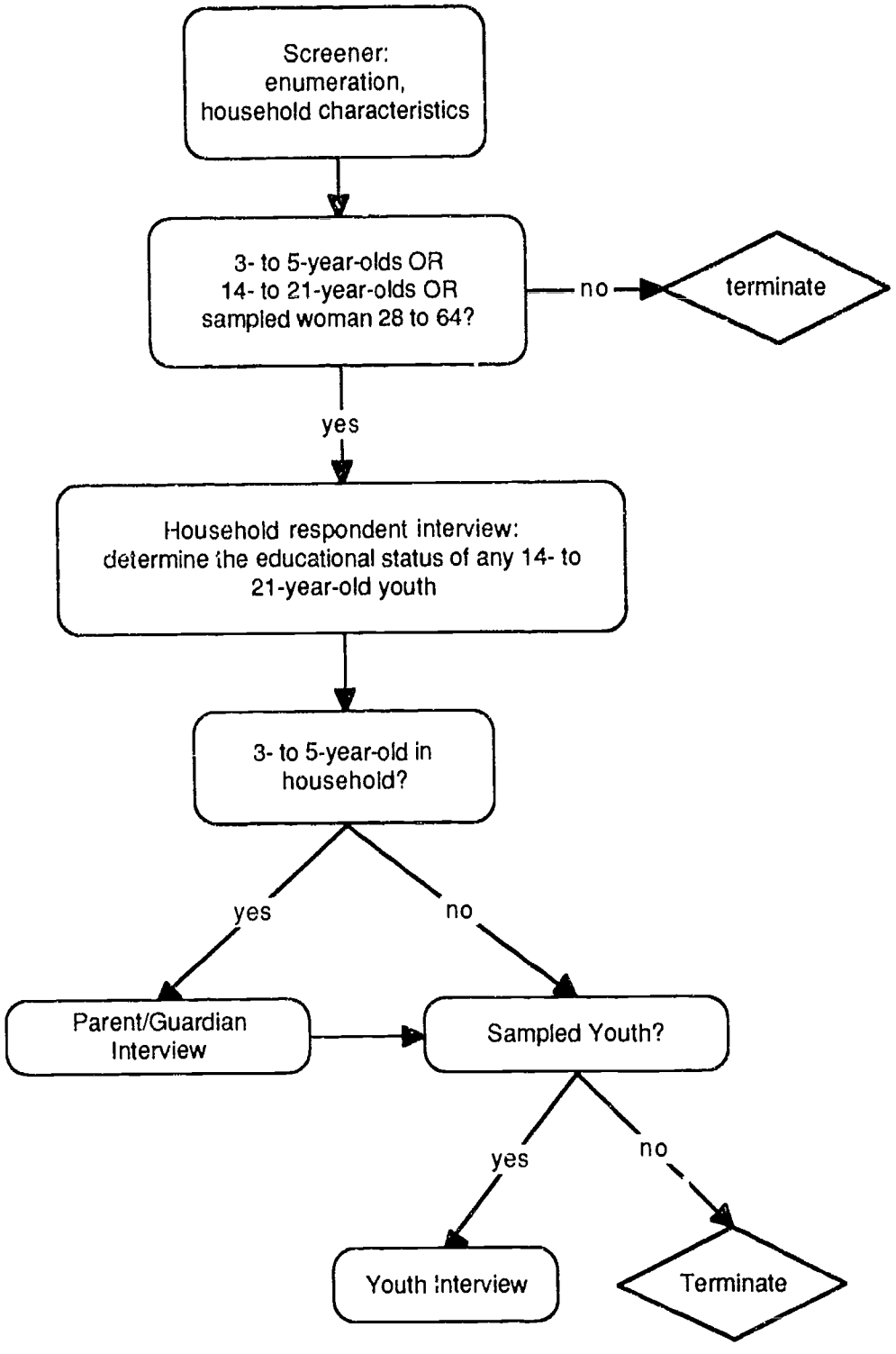
Flow of NHES Field Test Interviews

Figure 1 shows the flow of the NHES interviews. The process began with the Screener, in which questions were asked about the household and its phone number(s), the eligibility of the household (any members under 65) was determined, and the household members enumerated. Information on household characteristics was also collected in the Screener.

If the household contained any persons ages 14 to 21 years, the Household Respondent Interview (HRI) was used to collect information about the youths' educational statuses for sampling purposes. In addition, if there was a sampled woman 28 to 64 years of age, information was collected about the educational status of any of her 14- to 21-year-old children who live outside the household for the multiplicity sample (discussed below).

The results of the Screener and the HRI determined the extended interviews to be conducted, if any. Parent/Guardian Interviews were conducted in any

Figure 1. -- Flow of NHES Interviews



household in which there were 3- to 5-year-old children. Youth Interviews were conducted with all youth who met the study definition of a dropout, and with a sample of non-dropout youth. Since some of the youths were qualified to complete the HRI (those 18 years or older), the HRI and Youth respondents were occasionally the same person.

Many households required more than one extended interview to be conducted with various household members. In some cases, the same person was the Screener respondent, the Household Respondent, a sampled youth, and the Parent/Guardian of a 3- to 5-year-old.

Every effort was made to complete all applicable interviews with the respondent who answered the Screener at the time the Screener was completed. Interviewers then asked for any other household members to be interviewed.

The sections below describe the content of the extended interviews. Flowcharts depicting the extended interviews appear in section 4 of this report.

Parent/Guardian Interview

The Parent/Guardian Interview was designed to collect information on the early childhood educational experiences of 3- to 5-year-olds. This interview was conducted with the parent or guardian who said he or she knew the most about the child's care and education. Typically, in about 75 percent of cases, the respondent was the child's mother. In about 20 percent of cases, it was the father who responded to the interview. About 5 percent of respondents were other persons such as a grandparent, a foster parent, or other guardian.

The interview was composed of 5 general sections. The first section established the eligibility of the child by confirming the month and year of birth, and established the relationships of all household members to the child.

The second section of the interview concerned only 4- and 5-year-olds. The questions asked about enrollment in kindergarten or first grade, and went on to ask about specific aspects of the child's school. The third section identified arrangements in which children spent time and a series of questions was asked about each child care or preschool arrangement. This series of questions collected information on the setting, care provider, cost, hours, child-staff ratio, educational content, activities, reasons for selecting this care, and the parents' activities while the child was in care.

The fourth section concerned any handicapping condition the child may have had, and any handicapped services the child received. The final section concerned the child's educational environment at home. We discussed with the parent the materials available to the child, reading activity with the child, television viewing, and the parents' own educational levels.

Household Respondent Interview (HRI)

The Household Respondent was a knowledgeable adult member of the household who reported on the education status of the household youth. In the case of the multiplicity sample households (discussed below), HRIs were conducted for the out-of-household youth of sampled women. The HRI serves three important functions in NHES.

- First, it collects important information for all 14- to 21-year-olds without having to interview each separately. These data can be used to develop national estimates of numbers of dropouts and dropout rates.
- Second, the HRI provides the information required for sampling 14- to 21-year-olds for the Youth Interview
- Finally, by comparing the responses of household respondents and youths, it is possible to assess similarities and differences in reports by youth themselves or by household proxy respondents.

The HRI began with the current enrollment status of the youth (i.e., whether the youth was enrolled in school during the last week, whether the youth was attending on a regular basis, and the type of program attended). The youth's enrollment status 1 year ago was then determined using parallel items. For those not enrolled in elementary/secondary school (el/sec), the diploma status was determined as well. These data served as the basis for sampling for the Youth Interview.

The HRI also collected information on whether the youth had any handicapping condition and whether the youth had received special education services, both

currently and in the past. The next section of the interview was concerned with employment status: whether the youth was employed, how many hours per week, at what wage, and whether the youth had been seeking work. Finally, the HRI collected background information such as the parents' educational statuses.

Overview of the Youth Interview

The Youth Interview was conducted with each sampled youth after the HRI was completed. Selection of youth for the extended interview was determined from enrollment, attendance, and diploma status items reported in the HRI.

The Youth Interview contained almost all the items from the HRI, permitting comparison of youth responses with those of the household respondent. The interview began by collecting current enrollment status of the youth (i.e., whether the youth was enrolled in school during the week prior to the interview, whether the youth was attending on a regular basis, and whether youth was attending any out of school program). The youth's enrollment status one year ago was then determined using parallel items. For those not enrolled, diploma status was obtained.

Youth identified as dropouts were asked a series of questions about leaving school and their plans for returning and becoming certified. All youth were asked questions about educational experiences while enrolled in elementary/secondary school, including services for handicapping conditions. The final series of questions collected information on employment status and family background.

Major Methodological Issues

The NHES Field Test included a number of tests and evaluations of issues related to the design and conduct of a telephone survey of education. Findings from these tests required consideration before a full-scale system could be established. These issues, briefly reviewed here, are discussed in detail in later reports in this series.

- **Oversampling:** The feasibility of oversampling blacks and Hispanics to improve the sample yield and estimates for these subgroups was evaluated in the Field Test. This was accomplished by increasing the probability of selection for those telephone clusters that were identified as containing 20 percent or more black or Hispanic residents. The results of this test appear in the report, *Effectiveness of Oversampling Blacks and Hispanics in the NHES Field Test.*

- **Proxy Reports:** Another major methodological issue examined in the Field Test is the correspondence between the responses of knowledgeable household respondents and those of the 14- to 21-year-old youths themselves about their educational status. In many surveys, one person responds to questions for all the members of the household. The responses of this household respondent are then used to classify the individuals by reported characteristics, such as dropout status. However, the responses of the youths themselves may differ from those of the respondent for a number of reasons, including perspectives and different knowledge. In the Field Test, both the household respondent and the youth were asked similar questions and the responses of the two sources were compared. The results of this comparison, which have implications for the use of single household respondents, appear in the report, *Proxy Reporting of Dropout Status in the NHES Field Test.*

- **Population Coverage:** One of the major concerns in any survey, especially a household survey conducted via telephone, is the failure to "cover" all persons in the population. In other words, there is concern that some persons who are eligible to be in the sample are excluded for a variety of reasons. The coverage issue, including the much publicized problems concerning some minority group members in the decennial census, is a major concern for all household surveys. In addition to the typical household coverage problems, a telephone survey fails to include about 7 percent of the U.S. population who live in nontelephone households.[2]

  An important issue associated with the telephone coverage problem is the concern that those who live in nontelephone households may have different characteristics than those who live in households with telephones. If these differences are large and data from

telephone households are used to estimate characteristics of the entire population, the resulting biases may have important consequences. A detailed analysis of telephone undercoverage bias was undertaken for the NHES. The results of this analysis and a discussion of special estimation techniques to reduce the effects of undercoverage bias appear in *Undercoverage Bias in the Field Test for the National Household Education Survey.*

- **Multiplicity Sampling:** The multiplicity sampling approach is one of the techniques that was tested specifically because of the concern about the coverage problem. In the Field Test, a 14- to 21-year-old youth was eligible for the sample not only if his or her household was sampled, but also if the household of the youth's mother was sampled. This approach was tested to see if it improved the coverage of the 14- to 21-year-old population and if it resulted in the capture of more dropouts through the sample of telephone numbers. An analysis of the effects of multiplicity sampling is presented in *Multiplicity Sampling for Dropouts in the NHES Field Test.*

Another issue that arose in the NHES Field Test is the complexity of the data collection and how well this can be addressed in a telephone survey. The diversity of child care and preschool arrangements and the presence of multiple children in a household was used to investigate the methodological capability of the NHES to address complex education-related topics. In addition, the NHES Field Test design called for multiple interviews per household. For example, a household might include one or more 3- to 5-year-old children and one or more 14- to 21-year-old youths. The need to collect information on each of these persons led to multiple interviews per household. This increased burden could have resulted in serious problems in response rates, and required careful assessment in the Field Test.

Telephone Survey Sample Design

The primary objective of the Field Test of the NHES was to investigate important methodological issues that are critical to evaluating the feasibility of using a telephone survey to collect data on education topics. The best mechanism for evaluating these issues was to conduct a survey under conditions as close as possible to those encountered in a full scale survey. Thus, the Field Test was conducted as would be any other survey, except that it was smaller in size than anticipated for future studies.

The two survey components of the Field Test were the educational status of 14- to 21-year-olds, with a special emphasis on dropouts, and the early childhood education characteristics of 3- to 5-year-olds. As noted above, several methodological issues were addressed within these surveys. One issue was the ability to improve the precision of estimates for black and Hispanic persons by oversampling methods. Other issues included the use of an extended definition of household membership to improve coverage of 14- to 21-year-olds, the "sharing" of the cost of screening households by using the households for more than one survey, and the study of the response characteristics of proxy respondents.

Population Sampled

The NHES Field Test sample was drawn from the telephone households of the noninstitutionalized civilian population of the 50 states and the District of Columbia. Telephone households include about 93 percent of the U.S. noninstitutionalized civilian population. The sample was designed to obtain information for two age groups: 3- to 5-year-olds and 14- to 21-year-olds. The approximate numbers of persons in these populations (based upon 1988 CPS estimates) are shown in the following table.

Populations	Population Size
Persons in households	
3- to 5-year-olds	10,949,000
14- to 21-year-olds	27,983,000
Persons in telephone households	
3- to 5-year-olds	9,684,000
14- to 21-year-olds	25,682,000

In addition to the restriction of the sample to persons living in telephone households, the NHES sample excluded members of the Armed Forces and institutional populations (e.g., inmates, patients in long-term care facilities). This restriction had a very small impact on the sample of households with 3- to 5-year-olds, since these persons are not members of the excluded populations, except in very rare cases. However, the impact on the 14- to 21-year-old population could be more significant.

The Census Bureau has the same type of restriction in its CPS and the impact of the restriction was recently studied with the following results.

> The Armed Forces and the institutional population differ greatly from the total population in age-sex structure. . . On March 1, 1988, males 18 to 64 years old constituted 90.0 percent of the Armed Forces population as compared with 30.5 percent of the total population, and females 65 years and over constituted 41.8 percent of the institutional population as compared with 7.3 percent of the total population. However, these two groups together accounted for only 2.1 percent of the of the total population, and as a result, the civilian noninstitutional population (which accounted for 97.9 percent of the total) had an age-sex structure very similar to the total population. Similarly, the social and economic characteristics of the Armed Forces and of the institutional population could differ greatly from those of the total population with relatively small differences between the characteristics of the total population and of the civilian noninstitutional population.[3]

The excluded population (institutionalized and noncivilian) is heavily concentrated in the over-21 segment of the population. As a result, the bias resulting from their exclusion was assumed to be relatively small for the NHES survey topics. The bias is small even if the difference between the excluded population and the sampled population is large, because the percentages of 3- to 5-year-olds and 14- to 21-year-olds that are excluded are small.

Random-Digit-Dialing Sample Selection

The sampling method used for the NHES is a variant of procedures developed by Warren Mitofsky and Joseph Waksberg.[4] The Mitofsky-Waksberg method produces an equal probability sample of households with telephones and requires a smaller number of telephone calls than the sampling procedures previously used for random digit dialing (RDD). A time-saving variant of this method, sometimes referred to as the "modified Waksberg procedure," was used for the NHES survey. The description below applies to both procedures, except the second stage steps which differ.

A list of all existing telephone area codes and existing prefix numbers within the areas was determined based on data tapes provided by AT&T. All possible combinations for the next two digits were added to the set of prefix areas. Thus, a list was established of all the possible first 8 digits of the 10 digits in telephone numbers. These eight-digit numbers were treated as Primary Sampling Units (PSUs).

A random selection was made of an eight-digit number from this list, and a two-digit random number was added to create a full telephone number. The number was dialed to determine if it was residential. If it was residential, the PSU was retained in the sample. If the dialed number was not residential, the PSU was rejected and no further calls within the PSU were made. Additional residential PSUs were selected in the same way until 1,000 were chosen. In the original Mitofsky-Waksberg method, within each residential PSU, the final two-digit combinations are selected at random and dialed within the same eight-digit group until a specified number of completed interviews is obtained. This sampling procedure produces an equal probability sample of telephone households.

The reason for sampling clusters of telephone numbers (the eight-digit PSUs), and then households within those clusters, rather than taking a simple random sample of telephone numbers is cost savings. The cost of the cluster sample is considerably below that of simple random sampling because there is considerable savings in the telephone operations. We estimate that with cluster sampling, the reduction in the number of telephone numbers to be dialed is at least 50 percent. The price paid for the cost savings is a small reduction in the precision of the estimates.

The procedure described above is a sequential process. It is not possible to determine in advance how many telephone numbers in a cluster need to be dialed in order to achieve the desired sample size of households. This is awkward to implement when a survey faces a tight deadline, as was the case with the NHES Field Test. An alternative, and faster, sampling method is to use a fixed number of telephone numbers per cluster, rather than a fixed number of households. This also provides a probability sample, but it is no longer self-weighting. The weight in each cluster is proportionate to the reciprocal of the number of sampled households in the cluster. This is the "modified Waksberg procedure" that was used for the NHES Field Test. This variant is described in more detail by Brick and Waksberg.[5]

Sample Sizes Required to Achieve Target Numbers

The Field Test sample was designed to identify 4,000 households with either a 3- to 5-year-old or a 14- to 21-year-old. Using the October 1986 CPS data tape, estimates were that about 15,000 households had to be screened to meet these goals.

The number of telephone numbers that must be dialed in order to obtain a sample of 15,000 households can be estimated in two steps. The first step is to identify household clusters. A sample of about 5,000 telephone numbers was needed to identify the 1,000 clusters since it takes an average of five telephone numbers to find one residential cluster. The second step is to identify residential phone numbers within the retained residential clusters. Typically, it takes about five telephone numbers to identify three residences once the cluster is identified as residential. In addition to the 60 percent residency rate, an 80 percent cooperation rate was assumed for the survey. Therefore, in order to achieve a sample of 15,000 participating households, 30,000 telephone numbers (30,000 x .60 x .80 is approximately equal to 15,000) were required. In each retained sampled cluster, 30 random numbers were selected.

The final step in the process was the sampling of individuals from the households. Estimates from the 1986 CPS indicated that the mean number of 14- to 21-year-old members was 1.4 in households with 14- to 21-year-olds. The mean number of 3- to 5-year-olds was 1.1 in households with 3- to 5-year-olds. These means do not vary much across race or ethnicity.

All identified 3- to 5-year-olds were included in the sample, but a further stage of sampling was introduced for the 14- to 21-year-olds. A Household Respondent Interview (HRI) was conducted for each 14- to 21-year-old. All 14- to 21-year-olds who were identified from information supplied by adult household respondents as being dropouts or not enrolled in school were sampled for an extended interview. All of these youth were included because of the need to obtain more detailed data on their experiences.[6] Only about one in five of the remaining youth were sampled for extended interviews because this number would be sufficient for comparison purposes and it would decrease interviewing costs.

Oversampling Blacks and Hispanics

Oversampling is generally introduced in surveys for one of two reasons. The first is to improve estimates of totals for certain domains. For example, if a substantial portion of a target population occurs in a small and well-defined subset of the total population, oversampling this subset reduces screening costs for a desired sample size. The second is to increase the sample size for domains of special analytic interest, for which an equal probability sample would not provide a sufficient sample. In the NHES, oversampling was studied for the latter reason.

Oversampling to increase sample sizes for blacks and Hispanics was used in the Field Test. Oversampling in a random-digit-dialing survey is typically limited because of the lack of information associating telephone numbers with the groups to be oversampled and the relatively high cost associated with screening households. For the Field Test, information from a Donnelley Marketing Information Services computer tape was used to oversample both black and Hispanic households The tape contained 1980 Census characteristics by telephone exchange (the area code and first three digits of the telephone number) and these were used to stratify the population of telephone exchanges by percentage black and Hispanic.

Telephone exchanges with concentrations of 20 percent or more blacks and Hispanics were identified and oversampled at a rate of 2 to 1. Note that the oversampling was within exchanges rather than restricted to black and Hispanic households. It would have been possible to subsample nonblack and non-Hispanic households in high minority exchanges areas to create a self-weighting sample for persons who are not black or Hispanic. However, because of the extensive screening required to locate members of any rare population, such as dropouts, it is clear that this loss in sample size would have been quite inefficient. A detailed analysis of the sample yield and the effects on the variances for these subgroups is presented in the report, *Oversampling Blacks and Hispanics in the NHES Field Test*.

Extended Household Definitions

One method for improving the coverage of a household survey is to consider alternative definitions of household residency. The typical household definition only includes persons who are currently

living in the household. For the 14- to 21-year-old component of the NHES Field Test, an extended definition of household residency was used. College housing residents, age 21 or less, were treated as members of their parents' households, and were given a chance of selection in the same way as other household members. When such a college housing resident was sampled for a Youth Interview from a household roster, the parent (or other respondent to the screening) was asked for a telephone number at which the student could be reached. These college students were sampled only as members of their parents' household.

A further extension of the definition of persons in a household involved multiplicity sampling. In the Field Test, the multiplicity sampling approach was used for approximately one-fourth of the households. For this subsample, all women aged 28 to 65 in the household were asked to provide information about their children who were 14 to 21 years old and not living in their household. The youth identified in this process were included in the Field Test sample. Telephone numbers and addresses for nonhousehold youth sampled for Youth Interviews were requested and used to trace the youth for interviewing.

There were two major reasons for utilizing multiplicity sampling. First, the coverage of dropouts in households with telephones and in general household surveys was a major concern. By extending the number of persons who are identified as being associated with a household in this fashion, it was expected that the sample would include some 14- to 21-year-olds from nontelephone households, who otherwise would not have had a chance of being included in the sample. In other words, there was some potential to reduce the coverage bias by using this method.

A second reason for studying this approach was that it provided a method for locating youth, especially dropouts, at a much reduced cost. With relatively little expense, the locating information could be used to include those youth who were identified as having a higher probability of being dropouts. A detailed analysis of the effectiveness of the multiplicity sampling procedure is presented in the report, *Multiplicity Sampling for Dropouts in the NHES Field Test*.

Procedures for Conducting Interviews

The following sections discuss the procedures used in the data collection phase of the NHES Field Test, including the use of computer assisted telephone interviewing (CATI), staff training, interviewer assignments and contact procedures, and quality control.

CATI System Advantages

The use of a CATI system for the NHES offered a number of advantages that facilitated the implementation of NHES survey procedures. Briefly, the most salient features of the CATI system for NHES were as follows:

- **Project Administration:** The CATI system reduced substantially the amount of paper recordkeeping ordinarily required for a telephone survey, such as contact records, and provided up-to-date reports on the status of cases, numbers and types of contacts, sizes of standing work queues, and interviewer productivity and response rates.

- **Eligibility and Sampling:** CATI automatically identified household and persons eligible for the NHES survey topics. It also selected appropriate households for the detailed household respondent interview, sampled households for multiplicity sampling questions, and sampled respondents for extended interviews.

- **Scheduling:** CATI fed telephone numbers to the interviewers, maintained a schedule of callback appointments, and rescheduled unsuccessful contact attempts to the appropriate day and time according to the protocol for the study.

- **Skip Patterns:** The CATI system automatically guided interviewers through the complex skip pattern in the questionnaire, reducing the potential for interviewer error. This is particularly important for a survey in which repeated series of questions are asked about a particular subject, such as child care.

- **Receipt Control:** The CATI system provided automatic receipt control in a flexible manner which was used to produce a variety of status reports.

The use of CATI for the NHES Field Test was critical because of the difficult skip patterns that arise when dealing with complex issues such as those associated with the educational activities of preschoolers. Without CATI, this would be a very difficult survey to administer, especially by telephone. The use of CATI is also very helpful when more than one topic is covered in a survey system, and when sampling of households or household members is required based on individual or household information collected during the survey, as it was in the NHES Field Test.

Interviewer Training

Interviewer training was conducted during the last week of September and the first week of October 1989. Interviewers were trained in two groups of about 28 each.

A total of 20 hours of project-specific training was provided to each interviewer in addition to the basic training in general interviewing techniques and the use of the CATI system. The NHES interviewer training was conducted during three four-hour week night sessions and one eight-hour weekend session for each group.

Interviewer training was conducted using the CATI system throughout. In this way, the trainees actually entered information in the CATI system during training scripts and lectures, providing them with "hands-on" experience prior to beginning data collection.

The topics covered in the training session included an introduction to the study, interactive lectures concerning each of the survey questionnaires, survey procedures, refusal avoidance, and practice role-play scripts.

Interviewing Procedures

Because the sample spanned four time zones, interviewing was scheduled to maximize use of evening and weekend hours. In household telephone surveys, evening and weekend calls are the most productive because adult household members are most likely to be home at these times. Conversely, weekdays and Friday and Saturday evenings tend to be less productive, since adult household members are less likely to be available.

NHES interviewers made at least seven attempts to screen households in order to determine the presence of eligible household members (those aged 3 to 5 or 14 to 21). These seven calls were staggered—made on different days of the week and at different times of the day over a 2-week period, and included two day calls, three evening calls and two weekend calls. Once a household was identified as eligible for an extended interview (youth or parent/guardian), the maximum number of calls was doubled to 14. When repeated attempts to contact the respondent proved unsuccessful, the case was referred to a telephone supervisor to discuss appropriate methods of completing an interview (e.g., holding a case for some time and releasing it for additional attempts later in the data collection period).

The CATI system scheduled cases automatically, based on an algorithm that was customized for the NHES survey. CATI assigned cases in the following order of priority:

- Cases that had specific appointments;
- Cases that had unspecified appointment/general callback times;
- Cases that were busy signals came up 15 minutes later for another attempt;
- Cases that had been attempted previously with no contact were tried during other specific time frames; and
- Cases that were new and had never been worked.

In random-digit-dial surveys, some clusters of telephone numbers yield the expected number of households, whereas other clusters contain relatively fewer households, requiring that additional numbers in these clusters be used in the survey. Those in this latter group are referred to as "low-yield" clusters and have proportionally fewer households than other clusters. In order to quickly identify these low-yield clusters, new work was distributed somewhat more

quickly in NHES than in other (e.g., list sample) telephone surveys. As soon as such a cluster was identified, additional numbers were released in these low-yield clusters, to increase the number of households contacted. The purpose of increasing the number of households in low-yield clusters is to reduce the variability in the weights. During the conduct of the Field Test, about 590 additional numbers were included in the sample.

Interviewers coded a case as a "language problem" when they encountered a non-English speaking respondent and there was no evidence of an English-speaking household member. An interview was conducted in Spanish if that was the respondent's language; all other languages received a final disposition of "language problem." A hard copy Spanish language translation of the survey instruments was provided to each Spanish-speaking interviewer, and responses were entered into the CATI system as the questions were asked.

Data Collection Quality Control

Data quality control efforts for the data collection phase began during the CATI development period. As the CATI system was programmed, extensive testing of the system was conducted. This testing included review by project research staff, telephone interviewing center staff, programmers themselves, and data preparation staff. The testing by staff members representing different aspects of the project was designed to ensure that the system was working properly from all of these perspectives.

To "shake down" the CATI system as a further effort to be sure that the system was working properly, a live pretest was conducted in early September, with a small sample of telephone numbers. Actual respondents tend to be less predictable and more varied in their responses than staff members who are testing a system. Therefore, by testing the system in this way, staff can determine if the system is ready for use with the actual sample.

Quality control activities continued during training and data collection. During interviewer training, interviewers were paired with one another and conducted role-play interviews on the telephone. Scripts for the role plays were developed by project staff to include a wide variety of scenarios in terms of household composition, interviews to be conducted, and response patterns. The interviewers in training did not see these scripts in advance. Project staff monitored the role plays and provided feedback and additional training as necessary.

When interviewers began actual data collection, they were monitored on an ongoing basis by telephone center supervisors. In addition, project research staff monitored the interviewers occasionally. When problems were encountered, additional training was provided. Data preparation staff also reviewed the cases from the CATI system as they were completed, and referred problems to the project staff for resolution. Interviewer memos were posted and distributed when any recurring problems were identified.

At least once each week, the CATI management system produced computer generated reports that displayed response rates, refusal rates, and refusal conversion rates for each NHES interviewer. These reports assisted telephone center supervisors in identifying interviewer performance problems that may not have been detected through monitoring.

In addition, daily CATI reports were produced that showed the current status of all interviews and cases. Daily reports were monitored by project staff throughout the data collection period, and were provided to NCES on a weekly basis.

Survey Response

This section describes the outcomes of the random-digit-dial NHES Field Test survey, including the unit and item response rates. Because the NHES Field Test was designed to examine the NHES as a methodological approach to addressing issues in education, an important aspect of the methodological assessment is the response rates that can be obtained for the surveys. Screening response rates are always of concern in random-digit-dial surveys, and this is particularly true when full household enumerations are required. A detailed analysis of unit and item response was deemed necessary to the assessment of the NHES Field Test.

Unit Response Analysis

Unit response rates are defined as the number of units (telephone numbers, households, or persons) that completed the required interview divided by the number of units that were sampled and eligible to

complete the interview. In some cases, these rates were easily defined and computed. In other cases, the rates had to be estimated. The methodologies used for estimating the response or completion rates at each stage of the interview process are described in this section.

Sampling Clusters and Residential Cluster Identification

As described in the previous chapter, the NHES Field Test used a modified Waksberg procedure for selecting the sample. The first step in sampling was to determine which clusters of telephone numbers would be used. For the NHES Field Test, a cluster was defined as the first eight digits of a telephone number. A random two-digit number was added to the cluster number to form a complete telephone number. This number is referred to as the prime number.

A sample of 1,000 residential clusters was required for NHES. Because of procedures designed to oversample black and Hispanic households (using the oversampling procedure described by Mohadjer[7]), two sets of clusters were sampled. One set was for areas with more than 20 percent minority residence and the other for all other areas. The rationale for oversampling these areas is described in detail by Mohadjer[8]. The basic intent is to sample areas with high concentrations of blacks and Hispanics without seriously affecting the precision of totals across all areas.

A total of 337 high minority-concentration clusters and 663 low minority clusters were targeted. To obtain them, a sample of 5,000 clusters was generated and telephoned to identify residential clusters. Typically, 20 to 25 percent of clusters are retained using these procedures. For the Field Test, 25 percent of the clusters were retained. This total included 31 percent of the high minority-concentration clusters (524 of the 1,685) and 21 percent of the low minority clusters (701 of the 3,315). This difference between low and high minority clusters may be associated with the tendency of high minority clusters to be located in urban areas, which tend to have a higher within-cluster household density.

Since the retained sample of residential clusters exceeded the targeted number for both types, a sample of 337 of the 524 retained high minority clusters and 663 of the 701 low minority clusters were randomly selected and used as the first stage sample. This oversampling of clusters was accounted for in the development of sampling weights.

Sampling Telephone Numbers and Identifying Eligible Households

After the 1,000 residential clusters were selected, the next step was the identification of residential households for a sample of the telephone numbers within the clusters. A sample of 30 of the telephone numbers within each of the 1,000 clusters was randomly selected. Additional telephone numbers were selected from within the cluster if the number of households identified in the cluster was small (fewer than four). The purpose of adding these numbers was to reduce the variability in the weights. A total of 590 additional telephone numbers were included in the NHES Field Test as a result of this procedure. The total number of telephone numbers dialed was 30,590.

The expected within-cluster residency rate (the number of residential households in a cluster divided by the 100 numbers in the cluster) for a RDD survey using this design is between 60 and 65 percent. Of the 30,590 numbers that were dialed for the NHES Field Test, 60 percent were identified as residential, 36 percent were identified as nonresidential, and 4 percent could not be classified by residential status (table 1). The unclassified numbers are telephones that were dialed at least 7 times (almost all were dialed 14 times) over a varied schedule of daytime, nighttime, and weekends but were never answered. If these numbers are proportionally allocated by the residency rates associated with the numbers that were classified, then the estimated within-cluster residency rate is 63 percent. The number of residential telephone numbers that participated (i.e., someone in the household was willing to complete the screening items needed to determine if there were household members who might be eligible for NHES) is also shown in the table.

Three different methods for computing response rates for this screening stage were used (table 1). The three methods differ in how they handle the telephone numbers that were never classified by residency status. The numerator for all three screener response rates is the number of telephone numbers that were identified as residential and participating. The denominator for the conservative estimate is the sum of the residential, participating and not participating numbers and the unknown residency status numbers. It

Table 1.—Number of telephone numbers dialed, residential status, and screener response rates

Screener response category	Number	Percent of all numbers	Percent of residential
Total	30,590	100.0	
Identified as residential	18,406	60.2	100.0
Participating	15,037	49.2	81.7
Not participating	3,369	11.0	18.3
Identified as not residential	11,041	36.1	
Unknown residential status	1,143	3.7	
Screener response rates[1]	**Rate**		
Estimated (CASRO) response rate	78.6%		
Conservative response rate	76.9		
Liberal response rate	81.7		

[1]All three response rates were computed using the number of participating households as the numerator. The denominator for the conservative rate includes the numbers with unknown residential status. The denominator for the liberal rate does not include the numbers with unknown status. The denominator for the estimated (CASRO) rate includes a proportion (based upon the residency rate for the known numbers) of the numbers with unknown residential status.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

is conservative because it assumes that all the unknown residency status numbers are residential. For the Field Test, the conservative screener response rate is 77 percent. The liberal estimate takes the opposite approach. The denominator for the liberal rate excludes the unknown residency status numbers, assuming they are not residential numbers. The resulting response rate for the liberal approach is 82 percent.

The actual response rate is most likely between these two extremes. The estimated response rate is a compromise estimate that assumes that the numbers with unknown residency status have the same distribution as the numbers for which residency status is known. The effect of this assumption is to estimate that about 63 percent of the unknown numbers are residential and include them in the denominator. The screener response rate estimated in this manner is 79 percent. The estimated screener response rate is consistent with the method suggested by the Council of American Survey Research Organizations (CASRO).[9]

The CASRO response rate probably underestimates the true response rate. Several studies that have examined telephone numbers with unresolved residency status (including checks with telephone companies) have found that the majority of these numbers are nonresidential. In another RDD study, the 1987 Adult Smoking Survey, only about one-third of the unresolved numbers were found to be residential. This finding is consistent with studies such as in the National Crime Survey test[10] in which 38 percent of unresolved numbers were residential.

Table 2 provides greater detail on the participating and nonparticipating residential telephone numbers. The participating households are divided into out-of-scope and in-scope households. A household was in-scope if it contained a person between 2 and 6 years of age, a person between 13 and 22 years of age, or a female aged 28 to 65 years in a household selected for the multiplicity sample. These broader age ranges were utilized because Screener respondents are sometimes in error about the current age of household members. The final eligibility requirements for the survey, based on the actual month and year of birth obtained from the appropriate respondent, were more restrictive than these initial Screener requirements; therefore, more than 1,000 of the initially eligible households were ultimately found to be ineligible for the survey.

Unweighted counts of telephone numbers were used to compute these response rates instead of counts weighted by the inverse of the probability of selection. There are two justifications for this method. First, the full probability of selection depends on factors (such as the number of telephones in the household) that are not known for nonresponding numbers. Second, all the telephone numbers were selected with equal probability (in their high and low minority strata) so that weighted and unweighted rates are nearly identical. This finding is discussed below.

The vast majority (84 percent) of the residential households which did not participate in the survey were refusals. Because of the sparsity of data on households that do not participate in RDD surveys, it is difficult to analyze the response patterns associated with refusals. One important variable that is available for all households is the classification of the telephone number as being in a high or low minority-concentration cluster. For the Screener, the percent of telephone numbers that were refusals was nearly identical for the high and low minority clusters (16.3 percent and 15.7 percent, respectively). Although this sample indicator is very limited, it does suggest that minority residence within a cluster is not a source of differential response bias. We would suspect that if response rates differed drastically by race, then the response rates of high and low minority clusters might be somewhat different.

A Spanish language version of the instrument was used in order to reduce the number of language problem cases. Cases identified as language problems were followed up by interviewers fluent in Spanish. Interviews were completed in Spanish for 244 Screeners, 87 Household Respondent Interviews, 83 Youth Interviews, and 59 Parent Interviews. (All of these cases were coded as initial language problems, but the followup interviews may have been done in English for some of the cases.) If members of the household did not speak English or Spanish, or the persons could not be reached for a Spanish language interview, the case was coded as a final language problem.

The maximum call category contains the telephone numbers of households that failed to respond to the screener despite at least seven attempts over a specified variety of times. These numbers were classified as residential numbers, since their status was known from the contacts made. For example, a contact with a household may have been made, but an adult

Table 2.—Number and percentage of telephone households, by Screener response category

Screener response category	Number	Percent
Participating residential phone numbers	15,037	100.0
Out-of-scope households	9,589	63.8
In-scope[1] households	5,448	36.2
Not participating residential phone numbers	3,369	100.0
Refusals	2,832	84.1
Language problems	189	5.6
Other problems	112	3.3
Maximum calls	236	7.0

[1]In-scope households are those which satisfied the more strict screening age eligibility requirements. Only 4,374 of the 5,448 households which met the screening requirements actually contained a person eligible for the survey.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

household member eligible to answer the Screener was not available and could not be reached on subsequent attempts. The "other problems" category was used to capture miscellaneous categories of nonresponse, such as respondents who moved after initial contact, respondents who would not be available to participate until after the survey period ended, and cases which were only one or two calls short of being coded in the maximum call category when data collection was terminated.

Classification of Eligible Households

A household could be eligible for the Field Test if either a 3- to 5-year-old resided in the household or a 14- to 21-year-old civilian was a member of the household. We obtained a sample of 3,190 households with 14- to 21-year olds, including 2,987 with this population only and 203 also containing 3- to 5-year-olds (table 3). The number of households with 14- to 21-year-old youth was close to the expected number of 3,330, based on estimates from the October 1988 CPS. We obtained a sample of 1,387 households with 3- to 5-year-olds, of which 203 also contained 14- to 21-year olds; the expected number was 1,050. The percentage of households with members in both age ranges was 5 percent, slightly greater than the expected 2 percent. Table 4 shows the distribution of the number of eligible households, by type of household members eligible for the survey and the number of eligible persons per household. The number of 3- to 5-year-olds in households with both types of eligible persons is shown in the parentheses in the last column. The figures shown include the multiplicity sample. In this approach, the out-of-household 14- to 21-year-old sampled women were eligible for sampling. This approach, which was utilized in one of four households, increased the number of 14- to 21-year-olds by 199.

Among participating households, 21.2 percent had at least one 14- to 21-year-old—slightly lower than the 22.6 percent expected, based upon the 1988 CPS data. About 9.2 percent of participating households had 3- to 5-year-olds, again slightly below the 10.4 percent expected, based on the 1988 CPS data. The average number of eligible persons per household was 1.1 for 3- to 5-year-olds and 1.4 for 14- to 21-year-olds. These averages matched the CPS estimates for the number of members per household in households with such members.

Obtaining Interviews for Eligible Persons

Although several different interview processes were used in the Field Test, three potential interviews are of particular interest to analysts of the data. One is the Parent Interview with the parent or guardian of each 3- to 5-year-old in the household. The second is the Household Respondent Interview (HRI) with a person (possibly the youth him- or herself) knowledgeable about the educational status of each 14- to 21-year-old in the household. The third is the Youth Interview, conducted with the youth him- or herself for a sample of the 14- to 21-year-old household members.

Youth Interviews were conducted for each 14- to 21-year-old identified by the household respondent as a dropout. These youths are called certainty selections. For other 14- to 21-year-olds, a sample of about one in five youths (called noncertainty selections) were chosen for administration of the youth interview. The total sample size for each category of youth interview is shown in Table 5. The number of certainty selections (1,158) was much larger than the anticipated sample of 300 persons. This occurred because the sampling algorithm erroneously included as certainty cases persons with a high school diploma who were not currently enrolled in an educational program. These youth were included as certainty cases along with dropouts. As a result, the classification of persons as certainty and noncertainty cases does not have much substantive importance.

Because of the ambiguity in the classification of cases by certainty status, a direct comparison to CPS estimates of dropouts was made to evaluate the yield of the NHES. Based upon the 1988 CPS, the number of status dropouts expected from a sample of 3,190 telephone households with 14- to 21-year-olds is about 322. The number obtained in the NHES was 319. While the estimate of the expected number of cases does not take into account the oversampling of high minority clusters, these figures do indicate that the sample yield is about what would be expected. The oversampling would increase the expected values slightly.

Table 5 also shows the number of sampled persons for each category of household member and the number of persons who completed the interview. The data include the cases in the multiplicity sample as well as those in the sample households. The percentage of sampled persons who responded to each interview is

Table 3.—Number and percentage of participating eligible households, by type of eligible person

Type of eligible person	Number of households	Percent
Total	4,374	100.0
Only 3- to 5-year-olds	1,184	27.1
Only 14- to 21-year-olds	2,987	68.3
Both 3- to 5-year-olds and 14- to 21-year-olds	203	4.6

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

Table 4.—Number and type of participating, eligible households, by number of eligible persons in household

Number of eligible persons per household	Number of participating households with eligible persons			
	Only 3- to 5-year-olds	Only 14- to 21-year-olds	3- to 5-year-olds and 14- to 21-year-olds[1]	
Total	1,184	2,987	203	(226)
1	1,046	2,030	0	(0)
2	135	779	125	(125)
3	3	143	62	(78)
4	0	31	14	(19)
5	0	3	0	(0)
6	0	1	1	(2)
7	0	0	1	(2)

[1]The number of 3- to 5-year-olds in these households is given in parentheses after the count of households.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

Table 5.—Number of sampled and completed interviews, completion rates, and response rates, by type of interview

Type of interview	Number	Completion rate	Overall estimated response rate
Parent Interviews about 3- to 5-year-olds			
Sampled for interview	1,551		
Completed interviews	1,530	98.6%	77.5%
Household Respondent Interviews about 14- to 21-year-olds			
Sampled for interview	4,441		
Completed interviews	4,313	97.1	76.3
Youth Interviews			
All interviews			
Sampled for interview	1,863		
Completed interviews	1,604	86.1	65.7
Certainty selections			
Sampled for interview	1,158		
Completed interviews	985	85.1	64.9
Certainty selections			
Sampled for interview	705		
Completed interviews	619	87.8	67.0

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

called the completion rate—a conditional response rate indicating the percent of interviews that were completed if the household was screened successfully. The completion rate was 99 percent for the Parent/Guardian Interview, 97 percent for the HRI, and 86 percent for the Youth Interview.

The overall response rate for the Parent/Guardian Interview and the HRI was the product of the Screener response rate (79 percent) and the appropriate completion rate. These overall response rates were 78 and 76 percent, respectively. The overall response rate for the 14-to 21-year-old Youth Interview had an additional component, since this interview could not be conducted unless an HRI was completed. The overall response rate of 66 percent for the Youth Interview was, therefore, the product of the Screener response rate, the HRI completion rate, and the Youth Interview completion rate.

A potential source of bias in a survey is differential response rates for key population domains. Completion rates for the HRI and the Youth Interview were also calculated by the domains used in estimation (table 6). The domains indicated the presence of a telephone in the household of the youth and the youth's mother and whether or not the youth lived in the same household as the mother. An additional domain, which overlapped the others, indicated whether the youth was sampled through multiplicity sampling. Considerable variation by domain could introduce bias into the results if it were not taken into account in the estimation process. The completion rates for the HRI were consistently high, in the range of 93 to 98 percent, for all domains.

For the Youth Interviews, the completion rates were lower for youths who did not live in telephone households (41 percent) and those who were sampled by multiplicity sampling based on the reports of their mothers who live in telephone households (50 percent). It was very difficult to locate and conduct telephone interviews for out-of-household youths sampled in this way, especially those who do not have a telephone in their household.

Although the completion rates for the Youth Interview were low, they are higher than was expected prior to the Field Test. Phone numbers of friends, work phone numbers, and phone numbers of other relatives were used to help locate and interview youths without home telephones. Including even 40 percent of the persons who otherwise would be outside the scope of a telephone survey may have significant implications for bias reduction. Furthermore, HRI's were completed for 97 percent of the multiplicity sample youths. The evaluation of the multiplicity sampling includes these completion rates and other factors, such as the usefulness of the household respondent data. (For more information on multiplicity sampling, see *Multiplicity Sampling for Dropouts in the NHES Field Test.*)

Comparison of NHES Response Rates with Other Surveys

In order to help evaluate the unit response rates of the NHES Field Test, these rates were compared with those obtained in similar RDD telephone surveys and with NCES statistical standards for response rates. NCES Standards[11] indicate that the target response rate for a cross-sectional survey should be at least 85 percent. For hierarchically selected surveys, the target response rate applies to each hierarchy. For example, a survey of students within schools would have target response rates of 85 percent for both the schools and the students, resulting in a final response rate of 72 percent.

Applying this standard to NHES, the response rate for the Screener was below the target for a cross-sectional survey. If, however, the NHES is considered a hierarchical survey (sampling households and then persons within households), the response rates for both the HRI and the Parent/Guardian Interviews exceed the required standard of 72 percent.

Other U.S. Government RDD surveys have generally reported response rates in the same range as the Field Test. For example, Durant and Vitrano[12] reported response rates between 70 and 74 percent for the RDD portion of a survey conducted by the Census Bureau for the Bureau of Labor Statistics' Point of Purchase Survey. Alexander, Sebold, and Pfaff[13] reported response rates of between 75 and 80 percent in a test of RDD by the Census Bureau for the National Crime Survey. For the National Center for Health Statistics' Telephone Household Interview System (THIS), Fitti[14] reported response rates between 72 and 85 percent in the first years of the system's implementation. About 8 years later, the response rates were reported to be about 80 percent.[15]

The completion rates for the extended interviews, conditioned on the completion of the

Table 6.—Number of youth sampled, interviews completed, and interview completion rates, by type of interview and domain[1]

Type of interview and domain	Number sampled	Number completed	Completion rate
Household Respondent Interviews			
Domains			
Youth in same telephone household as mother	3,321	3,246	97.7%
Youth in telephone household, mother not in telephone household	174	162	93.1
Youth in telephone household, mother in different telephone household	887	848	95.6
Youth not in telephone household, mother in telephone household	59	57	96.6
Multiplicity sample youth[2]	199	192	96.5
Youth Interviews			
Domains			
Youth in same telephone household as mother	1,224	1,076	87.9
Youth in telephone household, mother not in telephone household	101	89	88.1
Youth in telephone household, mother in different telephone household	500	421	84.2
Youth not in telephone household, mother in telephone household	44	18	40.9
Multiplicity sample youth[2]	133	67	50.4

[1]The term domain refers to the population segment to which the youth belongs. These domains represent segments with different coverage rates and different probabilities of selection.

[2]The counts of the multiplicity sample youth overlap with the counts in the other domains.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

Screener, were excellent. These findings suggest that efforts should be concentrated on increasing the Screener response rates for future surveys.

The extent of the problem associated with refusals, especialiy for the Screener, is evident (table 7). About 84 percent of all nonresponse for the Screener was the result of refusals, with the remainder including maximum contact without completion, language problems, and other problems. The refusals were largely comprised of breakoffs (i.e., interviews that were begun but not completed because the respondent refused to continue at some point during the interview). These breakoffs account for 45 percent of all Screener nonresponse.

Breakoffs in interviews sometimes suggest problems associated with particular items in the instrument. To examine this possibility the number of breakoffs for each item on the instrument was tabulated (table 8). The Screener items are listed in the order in which they appear in the interview because breakoffs frequently occur in the first few items in an instrument.

The counts of breakoffs are clustered in two areas. About one-third occurred in the first two items of the Screener. The number of breakoffs in the initial items of the Screener was not large relative to expectations (for example, in the other three interviews the percent of breakoffs in the first three items exceeded 80 percent), which suggests that there were no particular problems with the items. Another third of breakoffs were encountered in the items used to enumerate the members of the household. (NHES interviewers indicated that these items caused them the greatest problem during the interview). These results suggest that alternatives to full household enumeration, or to enumeration at the start of the survey, should be considered as a means of improving the response rates for the Screener in future NHES collections.

Item Response Analysis

Persons who respond to a survey may not complete all of the items in all of the questionnaires they are presented. This type of nonresponse—item nonresponse—is a problem because it introduces bias into estimates just as unit nonresponse does. In the extreme, high item nonresponse rates can prevent the estimation of important characteristics from a survey.[16] For example, if a substantial proportion of respondents have missing values for a key variable, analyses including that measure would be incomplete or could be eliminated entirely.

Item nonresponse may occur for several reasons. One reason is that particular items, such as questions about household income, may be considered by some respondents to be too personal to answer. Another reason, most frequently encountered in lengthy interviews, is that the respondent breaks off the interview and does not finish it later. Item nonresponse may also occur in a complex survey as the result of faulty skip patterns in the interviews. If a skip pattern is incorrect, some people may never be given the chance to respond to a particular item. Additional reasons for item nonresponse are the failure of the interviewer to record the respondent's answer and the inability of the respondent to answer the question.

The use of CATI helped to eliminate some of these problems. One of the innovative features of the CATI system used for the NHES is that it enabled interviewers to enter and modify a matrix of data without having to return to previous screens to ask questions again for additional household members. This feature was especially useful in easing the response burden during household enumeration.

Finally, the CATI system also helps to prevent item nonresponse because it will not permit an interviewer to skip an appropriate item without entering a response. Nor will it permit the entry of an out-of-range response without confirmation of the value entered.

Another aspect of the CATI system that helped to reduce item nonresponse was the system of pre-determined skip patterns that prevented interviewer error resulting in failure to ask appropriate questions. Extensive testing of the system's skip patterns by several types of staff members helped to ensure that they were working properly prior to the beginning of data collection, as did the pretest of the CATI system with a small household sample.

An investigation was made of the approximate size of the item completion rates in the Field Test. The item completion rates are examined for selected items from each of the four main instruments—the Screener, Household Respondent Interview, Youth Interview, and Parent Interview.

An item is considered to have a valid response if the respondent provided an answer that was in the

Table 7.—Number and percentage of interviews not completed, by instrument

Instrument	Interviews not completed			
	Total number	Refusals	Types of refusals	
			Breakoffs[1]	Other[2]
Screener	3,369	84.1%	45.3%	38.7%
Household Respondent Interview	128	55.8	17.8	38.0
Youth Interview	259	35.4	9.3	26.0
Parent Interview	21	65.6	29.7	35.9

[1]Interviews that were begun but not completed because respondents refused to continue at some point during the interview.

[2]Includes language problems, maximum calls, and miscellaneous categories of nonresponse.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

Table 8.—Number and percentage of breakoffs in Screener, by item

Screener item listed in order of appearance in interview	Breakoff[1]	
	Number	Percent
Total	1,527	100.0
Phone for home or business use	413	27.0
Other phone in home	118	7.7
Other phones for home or business use	8	.5
Other household served by phones	107	7.0
Respondent household member over 17	68	4.5
Any household member over 17	9	.6
Ask for household member over 17	12	.8
Speak to head of household	2	.1
Any household members under 65	108	7.1
Introduction to matrix	132	8.6
Enumeration matrix	525	34.4
County	6	.4
Kind of home	2	.1
Income	11	.7
Any out-of-household youth of women	2	.1
Know about education of youth subject	1	.1
Name of parent/guardian	3	.2

[1]Breakoffs are interviews that were begun but not completed because respondents refused to continue at some point during the interview.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES)

acceptable range specified for that item. If the respondent refused to answer, did not know the answer, or the answer was not ascertained, the result is considered a nonresponse. The response "did not know the answer" may be a valid response. The inclusion of this category in the missing values tends to overstate the problem of missing responses. If the item was skipped in an interview as a part of a legitimate skip pattern, the item for that interview is not included in either the numerator or denominator of the item completion rate.

Because of the large number of items in each of the interviews, only some were selected for presentation. Included were the following: 1) items of high substantive importance for the particular interview; 2) items with relatively high rates of nonresponse; and 3) items that appear at both the beginning and end of the interview.

The item completion rates described in the following subsections are generally very high. Most items, including those at the end of the interview, have completion rates close to 100 percent, indicating that respondents did not "break off" the interviews due to their length. Because of the high item completion rates, the tabulations of item completion rates by demographic and other characteristics of the respondents have not been examined. Item completion rates are indicative of the willingness and ability of persons to respond to the particular questions asked. They do not reflect the validity or accuracy of those responses, and the overall success of the data collection cannot be measured without measures of external validity.

Screener Item Completion Rates

In the Field Test, the Screener was used to determine eligibility for the survey by enumerating the members of the households and to collect data on selected household characteristics. The determination of eligibility of the households was essential for completing other interviews in NHES. Any household for which the information needed to establish eligibility was not obtained was considered a unit nonrespondent. Therefore, the set of items in the Screener for which item nonresponse did not preclude inclusion in the survey was limited.

Table 9 shows the number of households in which the selected items on the Screener were attempted, those for which a legitimate response was obtained, and the resulting percent of attempts that were completed. The item completion rates for the first four items in the table are nearly 100 percent. Of these, the items addressing additional phone numbers and home tenure are important because they are used in the weighting and estimation process and nearly complete response is essential.

In the Field Test, a test of approaches for asking the income item was conducted. Approximately half of the sample was asked to report the actual household income, while the other half was asked to indicate which of several income ranges best described their household income. Those households that refused to respond to the specific income item were asked the income range item as a followup.

The income item falls in the valid range for 88 percent of all households. Of the sample of households that were first asked the specific income version, 65 percent gave a valid response. By administering the followup item, 65 percent of those who did not complete the question were converted to completions. As a result of this two-step procedure, a valid response was obtained for 86 percent of this sample of households (not shown in table). Of the sample of households that were first asked the income range version, 89 percent completed the item.

The item nonresponse to the specific income question produced a bias in the resulting data. Those who did not respond to the item appear to be disproportionately from lower income households. The resulting distribution, when compared to those asked the income range question, shows lower proportions of low income household, and higher proportions of moderate and high income households (figure 2).

The distribution of incomes for those who did not respond to the specific income item, but did respond to the ranges when they were used as a followup question, is shown in figure 3. The proportion of this group that report income in the two lower categories is substantial, although all income levels are represented among this group.

These results suggest that unless the specific income item is required for analytic uses, the income range item may be a preferable way to collect income data. Examination of the income values reported under the two procedures revealed a bias when the specific income item was used. Low income households had a much lower item response rate than did high income households. Therefore, even if specific income is

Table 9.—Item response rates for selected items from the NHES Screener

Screener item	Number attempted	Number completed	Percent completed
Additional phone numbers	5,441	5,438	99.9
Additional phone users	5,441	5,435	99.9
Home type	5,441	5,436	99.9
Home tenure	5,441	5,420	99.6
Income of household (all)	5,441	4,774[1]	87.7
Income amount item	2,657	1,730	65.1
Income range item	2,784	2,476	88.9

[1]Includes 568 of the 927 respondents who refused when asked the actual amount item but provided income when it was asked as a range.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey Field Test.

Figure 2. – Distribution of responses to specific and range income items

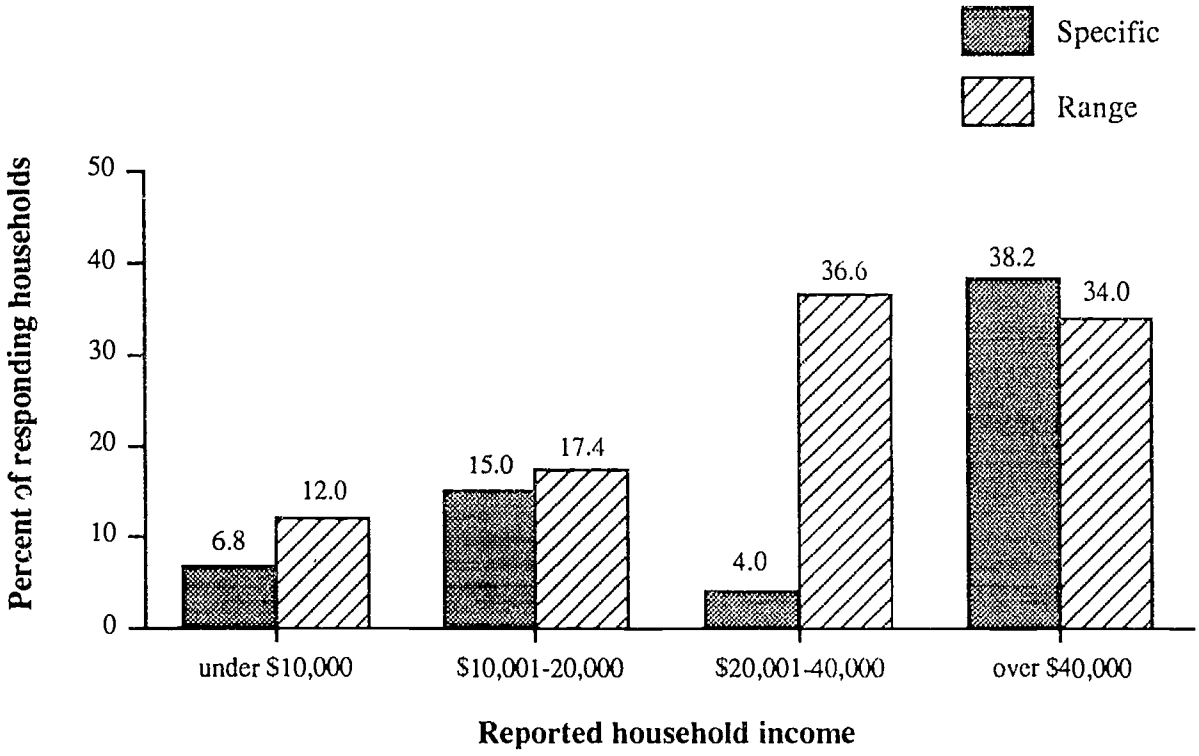
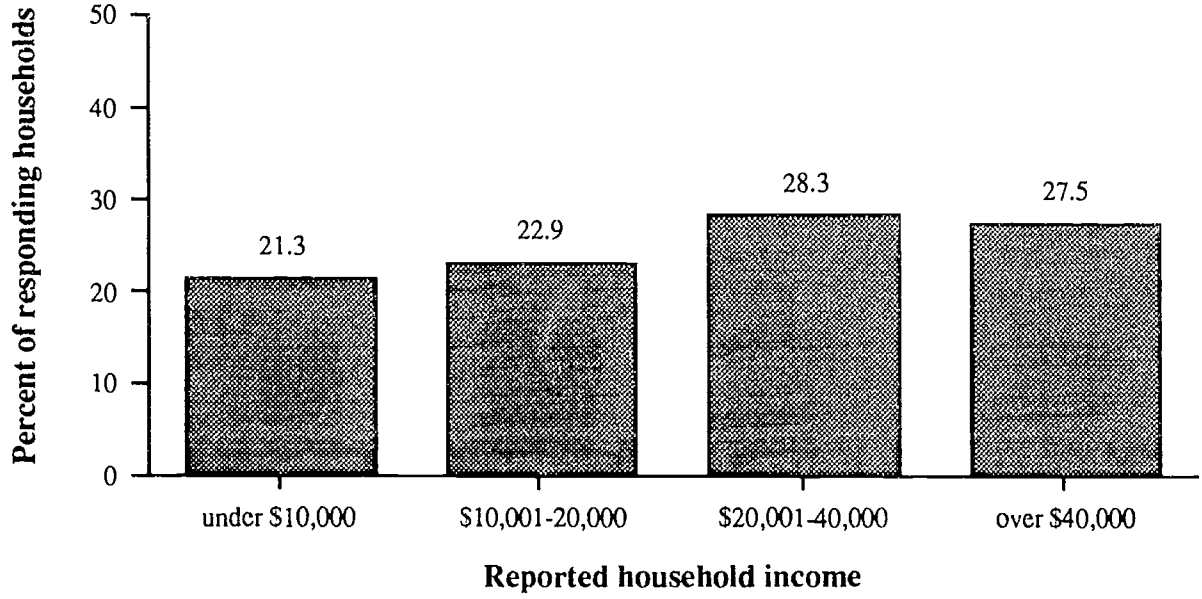


Figure 3. – Distribution of responses for those who did not answer the specific income item, but responded to the range item



needed in the analysis, there should always be an income range followup item to reduce the bias associated with the nonresponse to this item.

Household Respondent Interview (HRI) Item Completion Rates

The HRI was used to obtain data about the educational status of each 14- to 21-year-old in the household. The data from this interview were also used in sampling persons for the Youth Interview. The HRI was conducted with an adult in the household who was knowledgeable about the educational status of the 14- to 21-year-old residing in the household. If the respondent was unable to give both the birth date and the current enrollment status of the youth, that person was not eligible to serve as the household respondent for the youth. The 14- to 21-year-old could be the household respondent for him- or herself, provided the youth was at least 18 years old or there was no other adult member of the household.

The rules used in defining a respondent for the NHES can be compared with the ones used in the CPS. In the CPS, the interviewer is encouraged to interview the most knowledgeable adult (at least 14 years old) household member, although any adult member of the household is eligible and proxy respondents can be used in some circumstances. The rules used to define the respondents and the impact of proxy respondents in the CPS are described in Brooks and Bailar.[17]

HRIs with the mothers of out-of-household 14- to 21-year-old youths identified in the multiplicity sample are included in the item completion rates. This inclusion is appropriate because the mother was asked to complete an entire interview for these identified youths. The completion rates for these interviews are examined in greater detail in the evaluation of the effectiveness of multiplicity sampling in *Multiplicity Sampling for Dropouts in the NHES Field Test*.

Table 10 gives the item completion rates for selected items from the Household Respondent Interview. The number of items attempted varies across the selected items because of legitimate skip patterns. For example, the current educational program item was only asked for those persons currently enrolled in some program. The item on current services for the handicapped was asked only for those persons who have a handicap that affects their ability to perform in school.

The current enrollment status has a 100 percent item completion rate. As mentioned previously, this item was required in order to initiate this interview. If no interviewed person in the household was able to provide a response to this item, the HRI for the youth was considered a unit nonresponse. The item completion rates for almost all items exceed 99 percent. One exception is the item concerning the youth's main activity during the last week, which classified a youth as being in or out of the labor force. It is only asked for those youths who are not currently in an educational program and are not currently working for pay. About 87 percent of the qualified respondents provided a legitimate response for this item.

Youth Interview Item Completion Rates

The Youth Interview was conducted with the 14- to 21-year-old him/herself for a sample of the youths identified in the HRI. If a youth also completed the HRI, those items on the Youth Interview that were identical to items on the HRI simply were transferred into the appropriate locations on the Youth Interview record. Because of the relatively small sample size and skip patterns, the number of attempts is limited for some of the items in the Youth Interview. The completion rates for most items are excellent; in almost all cases the rates exceed 98 percent (table 11).

The item about main activity last week had the lowest item completion rate from the selected items presented on the HRI; at 88 percent, it is almost equal to the 87 percent response to this item in the HRI. Of the items selected for analysis, the one asking if the youth expects to continue his or her schooling has the lowest item completion rate—85 percent. A plausible explanation for this relatively low item completion rate is that the youth may not have decided on future plans regarding education. In this case it could be argued that "undecided" or "don't know" is a legitimate response, rather than a nonresponse. In fact, only one of the 142 youths refused to answer this item. About half of the nonrespondents said they did not know their plans, and an answer was not ascertained for the other half. Thus, if undecided or don't know is considered a valid response, the item completion rate for this item would be 92 percent.

Table 10.—Item response rates for selected items from the NHES Household Respondent Interview

Household Respondent Interview item	Number attempted	Number completed	Percent completed
Enrollment status - current	4,313	4,313	100.0
Educational program - current	3,225	3,223	99.9
Regularity of attendance - current	2,036	2,034	99.9
Grade or year - current	2,036	2,034	99.9
Enrollment status - last year	4,313	4,300	99.7
Educational program - last year	3,538	3,538	100.0
Regularity of attendance - last year	2,618	2,598	99.2
Grade or year - last year	2,618	2,611	99.7
Diploma status	2,277	2,611	99.6
Diploma type	1,961	1,961	100.0
Handicapping condition - current	4,313	4,301	99.7
Handicapped services - current	117	117	100.0
Employed - current	4,313	4,280	99.2
Main activity last week	119	104	87.4
Education of mother	4,313	3,974	97.1

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey Field Test.

Table 11.—Item response rates for selected items from the NHES Youth Interview

Youth Interview item	Number attempted	Number completed	Percent completed
Enrollment status - current	1,604	1,604	100.0
Educational program - current	683	683	100.0
Regularity of attendance - current	437	433	99.1
Grade or year - current	437	437	100.0
Enrollment status - last year	1,604	1,603	99.9
Educational program - last year	1,052	1,052	100.0
Regularity of attendance - last year	706	702	99.4
Grade or year - last year	706	702	99.4
Expect to continue schooling	921	779	84.6
Diploma status and type	1,167	1,167	100.0
Reason for leaving regular school	305	291	95.4
Handicapping condition - current	1,604	1,591	99.2
Services - current	13	12	92.3
Stopped attending - ever	1,604	1,591	99.2
Employed - current	1,604	1,587	98.9
Main activity last week	102	90	88.2
People in household now	1,604	1,587	98.9
Number of siblings	1,604	1,585	98.8
Education of mother	1,604	1,472	91.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey Field Test.

Parent/Guardian Interview Item Completion Rates

The Parent/Guardian Interview was used to collect information about the care and education of 3- to 5-year-olds. In order to be a respondent for the 3- to 5-year-old, the person must be able to provide the birth date and say that he or she was the person who knew most about the care and education of the child. For 95 percent of the children for whom interviews were completed, either the mother or the father was the respondent; about 80 percent of the respondents were the mothers.

As with the other instruments, the number of respondents for whom an item was attempted varies depending upon skip patterns. All of the completion rates for the selected items exceed 98 percent (table 12).

The item on the number of days per week that the child attends care/preschool is asked for each child care/preschool arrangement involving the child. The number of times the item was attempted includes each time the item was asked for each arrangement, and therefore includes multiple attempts for children with multiple care/preschool arrangements. The high item completion rates for the Parent/Guardian Interview are very important, especially because this interview took the longest time to complete and was the most complex. The item completion rates, when evaluated in conjunction with the unit response rates and the time required to complete the interviews, indicate the success of the NHES Field Test interview process.

Survey Timing

The length of time it takes to complete an interview is an important factor in all surveys, especially those conducted via telephone. While the survey should include all the important analytic variables, it should also be as short as possible to reduce the burden on the public and encourage complete and reliable response. Interview length can also be used to measure productivity and to plan future studies using similar items. A discussion of the effects of the length of the interview on response quality is given in Herzog and Bachman.[18]

For the NHES Field Test, the amount of time it took to complete various segments of each of the four major interviews was recorded in the CATI itself. If unedited, these timings could be misleading as a measure of burden on the public for several reasons. One major reason is that some interviews have discontinuous segments (i.e., a segment that is begun but not completed until a later date or time because of respondent availability). The CATI system was programmed to eliminate the timing variables for discontinuous interview sessions for this reason. Accordingly, the timings for about 2 percent of the HRIs, 8 percent of the Youth Interviews, and 4 percent of the Parent/Guardian Interviews were eliminated because of discontinuous interviews.

The unedited length of time recorded for the segment might be misleading for other reasons. For example, if the interviewer was forced to wait on the telephone while the respondent took care of other business (e.g., to attend to a young child or take another call), then the recorded length of time for the segment would reflect more time than was actually required for the interview. While this additional time distorts estimates of the burden on the respondent, its inclusion is appropriate if the timings are being used to estimate interviewer hours.

Since the purpose of this section of the report is to estimate respondent burden for the NHES interviews, the length of time for each segment was truncated to exclude extremely unreasonable values prior to the analysis. Consequently, the timings reported in this section should not be used for estimating interviewer time. Only those interviews for which all component times were within specified reasonable ranges (both upper and lower ranges) were retained. Flow diagrams for each instrument include the valid ranges for each segment of each interview (figures 4 to 6). If a segment for an interview was out of range, the timings for all segments of the interview were excluded. About 11 percent of the HRIs, 14 percent of the Youth Interviews, and 13 percent of the Parent/Guardian Interviews were excluded because of invalid times, but these exclusions did not have a substantial impact on the results of the length analysis.[19]

Table 13 shows the mean total times to complete the instruments before and after exclusion of items with invalid times. The mean times for all cases are only slightly greater than the mean times for the cases excluding those with invalid times. Since these values are so close, and the mean is relatively sensitive to outliers (one very large value can have a big influence on the mean), it is very unlikely that the

Table 12.—Item response rates for selected items from the NHES Parent/Guardian Interview

Parent Interview item	Number attempted	Number completed	Percent completed
Any regular school	1,009	1,009	100.0
Any care/preschool	1,498	1,498	100.0
Number of care/preschool	758	758	100.0
Days per week attends care/preschool	912[1]	907	99.4
Instructional program in care/preschool	851[1]	842	98.9
Mother at work during care/preschool	890[1]	878	98.6
Handicapping condition	1,530	1,525	99.7
Handicap limits access	72	72	100.0
Currently receiving special ed. services	72	71	98.6
Read stories with child	1,530	1,519	99.3
Mother employed	1,501	1,475	98.3
Father employed	1,244	1,232	99.0

[1]Each care/preschool arrangement for each child was asked about separately.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey Field Test.

Table 13.—Length of time (in minutes) for interviews, by inclusion in timing analysis summary by interview type

Interview	All cases with timing information[1]		Cases included in timing analysis (excludes outliers)	
	Number	Mean time	Number	Mean time
Screener	14,933	4.1	14,802	4.0
Household Respondent Interview	4,295	2.0	3,814	1.9
Youth Interview	1,489	4.2	1,262	3.8
Parent/Guardian Interview	1,476	9.1	1,271	8.5

[1]Includes all cases that had a time recorded for a segment without editing.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

exclusion of the cases with invalid times has resulted in large underestimates of interview timings.

Table 14 presents the length of the interviews in minutes by type of instrument. The times are given only for interviews that are considered complete (i.e., the respondent completed the most critical items). These include items concerned with school enrollment for the current and previous school years for 14- to 21-year-olds, and items concerning participation in child care and preschool arrangements for 3- to 5-year-olds. As noted previously, the vast majority of the respondents completed all of the items for an interview. Because of skip patterns in the interviews, all of the items were not asked of each respondent.

The first two sections of the table show the length of time for entire interviews and for certain combinations of interviews. The Screener took a mean of 4.0 minutes to complete per household; the Household Respondent Interview 1.9 minutes per 14- to 21-year-old; the Youth Interview, 3.8 minutes per 14- to 21-year-old; and the Parent/Guardian Interview, 8.5 minutes to complete per 3- to 5-year-old.

These overall averages for an interview are less informative than the timings for the different components of the interviews because of the presence of skip patterns.

The 3.8 minutes for the Youth Interview is an underestimate because if the youth was also the household respondent, the set of identical items which appear in both interviews was not repeated. Rather, the CATI system was programmed to apply the sampling algorithm and continue with the Youth Interview if the person was sampled. The identical items were later copied into the appropriate variables. The timings for the identical items were only recorded with the HRI since they were, in effect, asked only in that interview.

The second section of the table deals with combined interviews (i.e., situations in which more than one interview was completed for a household). The times in this section were computed only if all of the various interviews were completed for persons in the household, since including households with any unit nonresponses would underestimate the total household response time for the study. Comparing the means reported in this section with the means computed by aggregating the separate interviews indicates that the aggregates are reliable predictors of the interview times for the combined interview. Therefore, the length of time to complete other combinations of interviews can be estimated by simply adding up the separate components.[20] Therefore, the time associated with eligible households could be used to form aggregates for combinations of interviews.

The total interview times indicate that the Field Test was relatively successful in obtaining the required data without overburdening the household respondent. The evidence of the timings, especially when combined with the results of the item response analysis, supports the conclusion that the respondents did not react adversely to the interview length.

Screener Length

The mean length of time required to complete the Screener was 4.0 minutes. The length of the Screener was different depending on whether the household was eligible or ineligible. Screener interviews in households with members who were eligible for NHES required the completion of the full household enumeration and the acquisition of other household characteristics. If the household had no eligible members as determined by the enumeration, the interview was terminated before the other information was collected. In addition, ineligible households were probably smaller than eligible households (by definition ineligible households have no 2- to 6-year-olds and no 13- to 22-year-olds) and, therefore, took less time to enumerate.

An operational explanation for some of the difference in Screener timings between the eligible and ineligible households is related to the introduction of a series of eligibility screening items for refusal conversion purposes. Several studies (see Fitti,[21] for example) have suggested that household enumeration in the beginning of a survey increases nonresponse. Therefore, screening items were used in the refusal conversion process to try to convert initial refusals into responses. If the household did not meet any of the eligibility requirements as identified in the new screening items, then the Screener was ended without a full household enumeration. If the household contained any eligible members, the full enumeration was attempted. The household enumerations were not completed for about 15 percent of all ineligible households as a result of the use of the screening items for refusal conversion.

Table 14.—Length of time (in minutes) needed to complete the NHES Field Test instruments, by instrument

Completed instruments	Interview length in minutes					
	Number	Mean	Standard deviation	Quartiles		
				75%	Median	25%
Interview totals:						
Screener	14,802	4.0	1.8	5.1	3.7	2.6
Household Respondent Interview	3,814	1.9	0.7	2.3	1.7	1.3
Youth Interview [1]	1,262	3.8	1.3	4.5	3.7	3.0
Parent Interview	1,271	8.5	4.2	11.4	7.2	5.2
Combined interviews:[2]						
Screener/Household Respondent	2,697	7.7	1.6	8.7	7.5	6.6
Screener/Household Respondent/Youth	781	11.2	2.0	12.5	11.1	9.8
Screener/Parent	903	14.0	4.6	16.8	13.1	10.3
Interview components:						
Screener						
Eligible household	5,308	5.5	1.4	6.3	5.3	4.6
Ineligible household	9,494	3.1	1.3	3.7	2.8	2.2
Household Respondent Interview [3]						
Enrollment status last week	2,975	0.5	0.2	0.6	0.5	0.4
Enrollment status last year	1,387	0.6	0.3	0.7	0.5	0.4
Earned diploma/certificate	1,932	0.3	0.2	0.4	0.3	0.2
Handicapping condition	3,754	0.3	0.2	0.3	0.2	0.2
Employment	3,527	0.5	0.3	0.6	0.4	0.3
Background	3,527	0.4	0.2	0.5	0.4	0.3
Youth Interview [3]						
Enrollment status last week	546	0.5	0.2	0.6	0.4	0.4
Enrollment status last year	421	0.8	0.4	1.0	0.7	0.5
Other educational experience	1,072	0.7	0.3	0.8	0.6	0.5
Earned diploma/certificate	906	0.2	0.1	0.3	0.2	0.2
Handicapping condition	968	0.2	0.1	0.2	0.2	0.2
Employment	1,150	0.6	0.3	0.7	0.5	0.3
Background	1,150	2.0	0.6	2.4	1.8	1.5
Educational plans		1.4	0.7	1.7	1.2	0.9
Parent/Guardian Interview [3]						
Respondent verification/relationship	1,271	1.2	0.5	1.4	1.1	0.9
Enrolled in firstgrade/kindergarten	951	0.6	0.3	0.9	0.6	0.4
Attends day care/preschool	1,271	0.6	0.3	0.8	0.6	0.4
Care/preschool arrangement data	603	6.7	2.6	7.9	6.0	5.0
Handicapping condition	1,271	0.1	0.0	0.1	0.1	0.1
Home environment	1,271	3.0	0.8	3.4	2.9	2.4

[1]Total time reported for the Youth Interview may be an underestimate, since timings for the first two components of the interview are missing for some youths who responded to their own HRI. About 477 youth were their own HRI.

[2]Times reported for combinations of interviews within households are based only on those households for which all eligible interviews were completed.

[3]The interview lengths are for each eligible 14- to 21-year-old and 3- to 5-year-old in a household, not aggregated by household.

SOURCE: U.S. Department of Education, National Center for Education Statistics, "1989 National Household Education Survey Field Test."

Based on 5,308 eligible, completed Screeners, the mean for the eligible households was 5.5 minutes (see table 13). Three-fourths of these interviews took between 4.6 and 6.3 minutes to complete. The eligible households are the only ones which were subject to additional interviews.

The mean for the ineligible households was considerably smaller; based on 9,494 completed ineligible household Screeners it took only 3.1 minutes to complete the interview. The length of time required for the ineligible households at the 75th percentile is only 3.7 minutes, nearly a minute less than the length of time required at the 25th percentile for the eligible households.

Household Respondent Interview Length

The HRI was divided into six components, each containing a series of items about a particular topic (see figure 4). Each component took an average of approximately 0.5 minutes to complete, with relatively little variation from interview to interview. The number of interviews varies across the components of the HRI because of skip patterns. For example, youths were not asked the items about a diploma or certificate if they were still enrolled in high school. The proportion of interviews for which the times for items concerning enrollment status last year were recorded is relatively small because of an error in setting the timing variable in the CATI program. The error was corrected during the interview period, but the timings for many interviews were not retrievable.

Youth Interview Length

The Youth Interview was divided into components for timing in the same manner as the HRI (see figure 5). The two components that took the longest to complete concerned educational plans and the youth's background. Since the component on educational plans was only asked for dropouts, the timing is based on a small number of interviews. As noted before, if the youth was the household respondent, the identical items (enrollment status last week and last year) in the interviews were not repeated. The number of interviews for the enrollment status items are reduced as a result of this operation. The timings for these components in the Youth Interview are approximately equal to the timings for the components in the HRI.

Parent/Guardian Interview Length

The length of the Parent/Guardian Interview is very dependent upon the number of care/preschool arrangements that were reported for a child (table 15). Only about half of the sampled 3- to 5-year-olds were involved in any care/preschool arrangement, excluding kindergarten and first-grade enrollment. For children with no care/preschool arrangements, the interview on average took about one-third of the time required for a child with two arrangements. (As with the other two interviews, a flow diagram for the Parent/Guardian Interview is shown in figure 6).

The variability in the time required to complete the interview was a function of the time required to complete the care/preschool arrangement component. If a child was not in a care/preschool arrangement, this component was skipped. For a child with one, two, or three arrangements, the average times required to complete this component were 5.8 minutes, 10.6 minutes, and 13.2 minutes, respectively (not shown in table). This factor accounts for the large standard deviation and the large interquartile range shown in table 13.

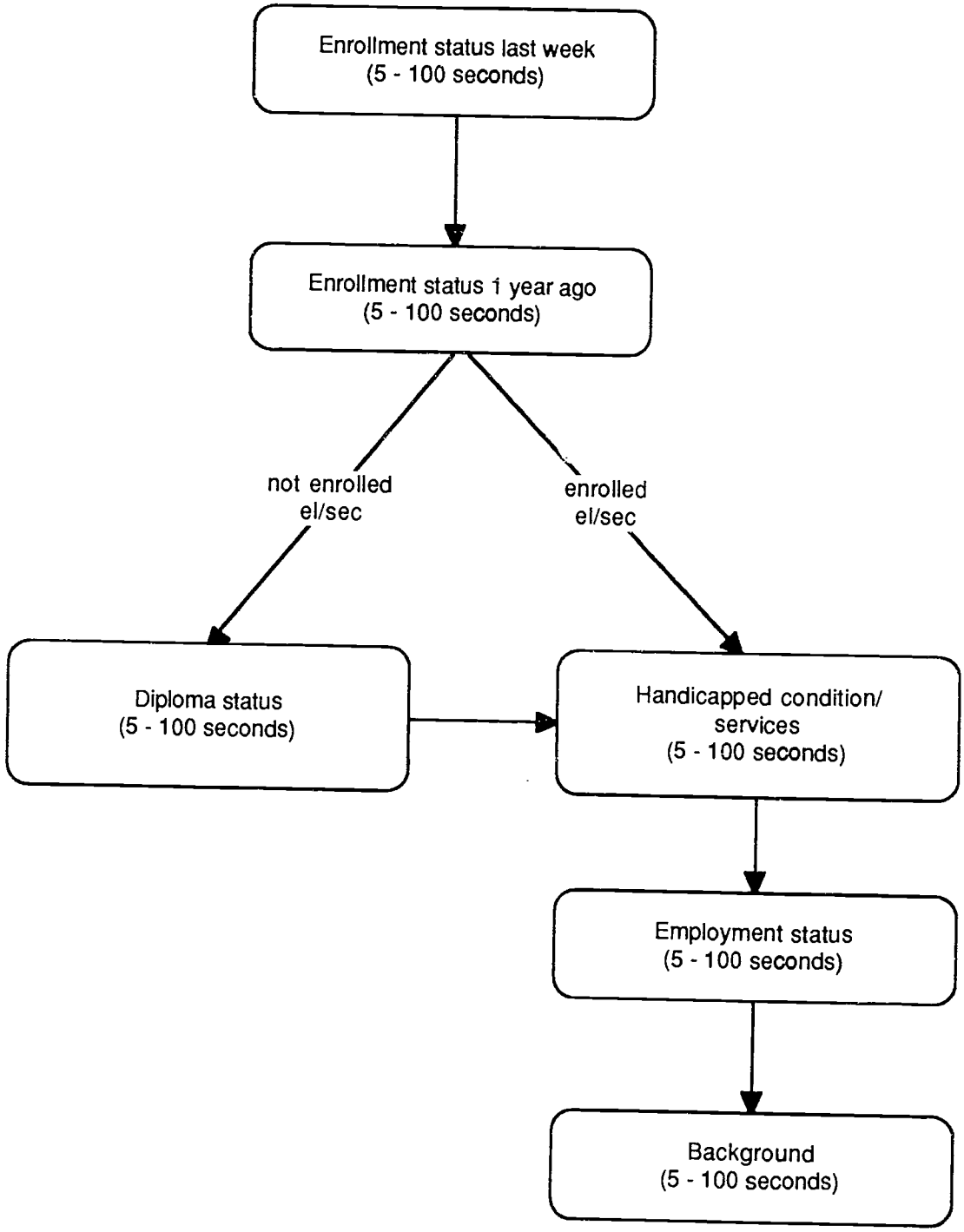
The other relatively time-consuming component in the Parent/Guardian Interview was the set of items related to the home environment. This component includes items on topics such as materials that are in the home, television viewing habits and the frequency of reading to the child. The mean time for this component was 3.0 minutes; the interquartile range, 1.0 minute.

The evidence from the item response analysis and the timings of the Parent/Guardian Interview suggests that the burden on the respondent was not so great as to introduce significant nonresponse problems. This finding appears to be true even for interviews in which the parent reported up to three different care/preschool arrangements for a child.

Summary and Conclusions

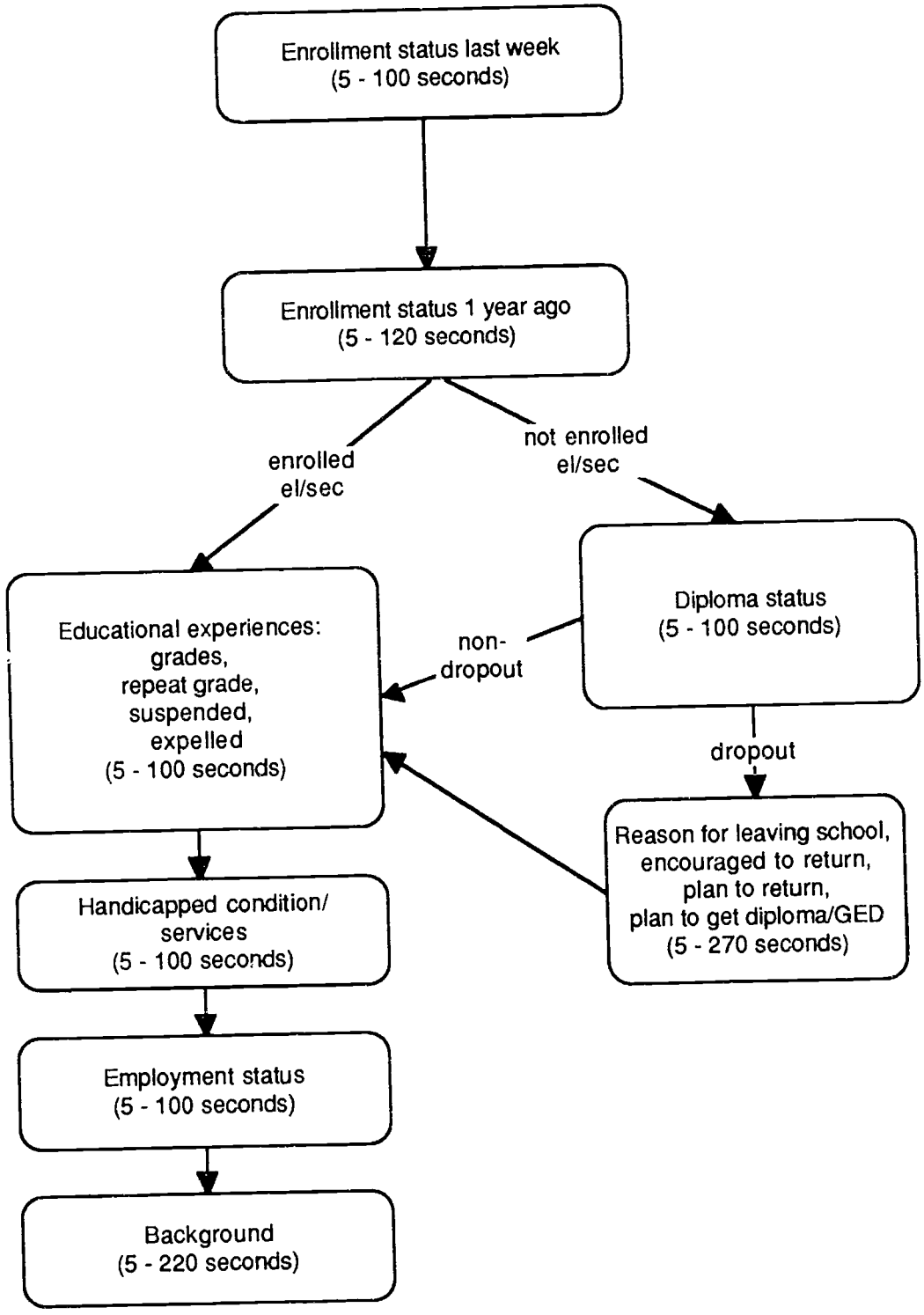
The National Household Education Survey is an important new data collection program being developed by the National Center for Education

Figure 4. – Household Respondent Interview (30 - 600 seconds)



Allowed timing ranges for each component are given in parentheses.

Figure 5. – Youth Interview (30 - 600 seconds)



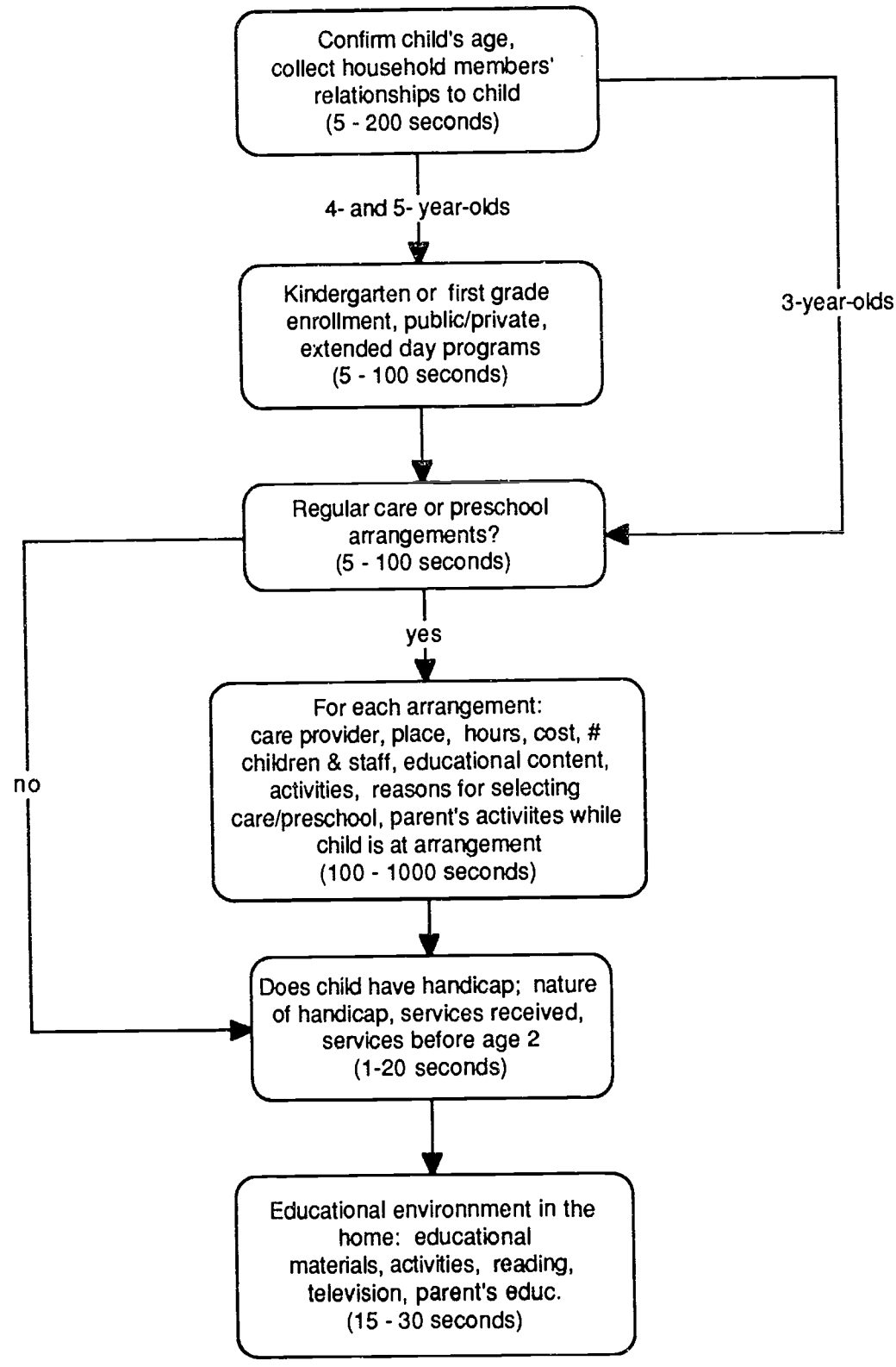
Allowed timing ranges for each component are given in parentheses.

Table 15.—Mean of time (in minutes) for Parent Interviews, by number of care arrangements

Number of Arrangements	Number	Mean time
None	665	5.3
One	492	11.1
Two	109	15.9
Three	5	18.7

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1989 National Household Education Survey (NHES) Field Test.

Figure 6. – Parent/Guardian Interview (30 - 1500 seconds)



Allowed timing ranges for each component are given in parentheses.

Statistics. The NHES is a telephone survey program that can be used to obtain detailed information on a variety of education issues. It offers the potential for examining education issues that have been difficult to address through the more traditional NCES surveys that are based on institutional samples.

In the fall of 1989 a field test of the NHES was implemented to study two subject matter areas and a host of methodological issues. The two subject areas were high school dropouts and the early childhood care and education of children. The key methodological issues were oversampling black and Hispanic telephone clusters, multiplicity sampling to identify additional dropouts, assessing undercoverage bias, and comparing youth and household proxy responses concerning education status. Each of these topics is presented in detail in the other reports in this series, cited earlier in this report.

The telephone methodology of the NHES offers some important advantages for the program. One of the major advantages of a telephone survey of households is that it is much less expensive than a comparable personal interview survey. It can also be instituted relatively quickly, address several subject matter areas at the same time, and provide results in a very timely fashion.

The results of the Field Test were encouraging for the future of the NHES. The Field Test showed that many of the concerns could be adequately handled in practice. It also revealed that each topic has its own unique set of circumstances that must be explored individually. Some topic areas will be more appropriate than others for the approach used in the NHES. For those topics which are not well suited for the NHES methodology, special studies or tests may be needed before implementation.

References

1. More detailed information on the test of the school-based approach may be found in the *National Household Education Survey Field Test: Methodology Report.*

2. Thornberry, O.T. and Massey, J.T. "Trends in United States Telephone Coverage Across Time and Subgroups," Chapter 3 in *Telephone Survey Methodology*, edited by Groves, et. al., John Wiley and Sons, 1988.

3. U.S. Department of Commerce, Bureau of the Census, *Current Population Reports: Population Profile of the United States, 1989*, Series P-23, No. 159 April 1989

4. Waksberg, J. "Sampling Methods for Random Digit Dialing," *Journal of the American Statistical Association*, March 1978.

5. Brick, J.M. and J. Waksberg. "Avoiding Sequential Sampling with Random Digit Dialing." *Survey Methodology*, June 1991.

6. The plan was to include only dropouts with certainty, but all students who were not enrolled were also included as the result of a specification error.

7. Mohadjer, Leyla. "Stratification of Prefix Areas for Sampling Rare Populations," Chapter 10 in *Telephone Survey Methodology*, edited by Groves, et al., New York, 1988.

8. Mohadjer, Leyla, and J. West, *Effectiveness of Oversampling Blacks and Hispanics in the NHES Field Test*, 1992.

9. Council of American Survey Research Organizations (CASRO), "Report of the CASRO Completion Rates Task Force," New York, Audits and Surveys, Inc., unpublished report, 1982.

10. Sebold, Janice. "Survey Period Length, Unanswered Numbers, and Nonresponse in Telephone Surveys," Chapter 15 in *Telephone Survey Methodology*, edited by Groves, et al., New York, 1988.

11. U.S. Department of Education, Office of Educational Research and Improvement, Center for Education Statistics. *Standards and Policies*. March 16, 1987. CES Standard 87-03-04.

12. Durant, S., and F. Vitrano "Response Rates in a Dual-Frame Sample Design and CATI Test." Presented at the American Statistical Association meeting in Washington, D.C., 1989.

13. Alexander, C., J. Sebold, and P. Pfaff, "Some Results of an Experiment with Telephone Sampling for the U.S. National Crime Victimization Survey." *Proceedings of the American Statistical Association Survey Research and Methods*, 1986.

14. Fitti, Joseph. "Some Results for the Telephone Household Interview System." Presented at the American Statistical Association meeting in Washington, D.C., 1979.

15. U.S. Department of Health and Human Services, Public Health Service, National Center for Health Statistics. "An Experimental Comparison of Telephone and Personal Health Interview Surveys." *Data Evaluation and Methods* Series 2, No. 106, 1987.

16. For a discussion of the general issues and consequences of item nonresponse, see Madow, Nisselson, and Olkin, editors. *Incomplete Data in Sample Surveys*, New York, 1983.

17. Brooks, C.A., and B.A. Bailar, "An Error Profile: Employment as Measured by the Current Population Survey," Statistical Policy Working Paper 3, U.S. Department of Commerce, Office of Statistical Policy and Standards, 1978.

18. Herzog, A.R., and J.G. Bachman, "Effects of Questionnaire Length on Response Quality," *Public Opinion Quarterly*, Vol. 45, 1981.

19. If all cases were included, the mean time to complete the interviews increased by .1 minutes for the Screener and the HRI, .4 minutes for the Youth Interview and .6 minutes for the Parent Interview.

20. The screening time for all households should not be used in the aggregations. Rather, the screening time for eligible households, which is described in the next section, is more appropriate for this use.

21. Fitti, Joseph. op. cit.

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